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The Elwha Report

Appendices E Through M

A Report Submitted Pursuant To Public Law 102-495

Restoration of the Elwha River Ecosystem & Native Anadromous Fisheries

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Appendices E Through M

DEPARTMENT OF THE INTERIOR
National Park Service
U.S. Fish and Wildlife Service
Bureau of Reclamation
Bureau of Indian Affairs

DEPARTMENT OF COMMERCE
National Marine Fisheries Service

LOWER ELWHA S'KLALLAM TRIBE

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APPENDIX E

RESPONSIBILITIES AND LIABILITIES

APPENDIX E

RESPONSIBILITIES AND LIABILITIES

OPERATION AND MAINTENANCE

The following discusses the interim operation of the Glines Canyon and Elwha Projects from the time of acquisition by the Federal Government until the dams are removed. If the Department of the Interior and/or National Park Service acquire responsibility for the inspection, operation, maintenance, repair, or disposal of the Elwha and Glines Canyon dams, it would be done in accordance with the Department of the Interior Departmental Manual Part 753, Dam Safety Program and National Park Service Management Guideline, NPS-40, Dams and Appurtenant Works; Maintenance, Operation, and Safety. Two operation options, with and without power generation, are described.

A. Option I - Operation for Power Production. This option involves the continued operation of the hydroelectric plants to the extent feasible, with the exception that no major maintenance would be undertaken. If a catastrophic failure occurred, the affected machine would be shut down permanently. Day-to-day maintenance, inspection, and lubrication in the plant, as well as required periodic inspections such as for pressure tanks and lifting devices, would continue. Maintenance and inspection records for equipment such as the interior of the penstock and the surge tank would be reviewed, but such inspections would probably be discontinued for the remaining life of the plants due to the cost required by the confined space entry requirements. This would put a limit on how long the plants could continue to run safely before they would have to be shut down, or the penstocks inspected and probably repaired.

With the above in mind, the Elwha Dam powerhouse structure, while old, is in reasonably good condition. It contains a single horizontal station service machine, two circa 1914 horizontal shaft machines, and two newer vertical shaft machines. The large machines are of the Francis type. The equipment appears to have been well maintained.

The Glines Canyon powerhouse also appears to be in good condition and normally runs unattended. It contains a single station service machine, and a single production machine. The station service is a horizontal-shaft turbine and generator and the large machine is a vertical shaft Francis-type.

Operation of both plants in the future would remain the same, with routine maintenance performed on the day shift, seven days a week, including lubrication, inspection, and minor adjustments. All but minor repairs and maintenance would be accomplished with contract forces. Major repairs would be evaluated on the basis of economics prior to doing the work, based on the then projected remaining life of the facility. The levels of the reservoirs would be maintained at the normal water surface, except during months when flow augmentation could occur.

It is assumed that the facilities' National Historical status and the short remaining life would preclude changes to bring the plants into compliance with OSHA requirements. The asbestos located on electrical equipment would be left in place and labelled as asbestos. Noise levels would continue to be high in the plants. Oil spill prevention and control measures would be reviewed but probably not modified extensively.

It is also assumed that all equipment has a useful life that equals or exceeds the time which would be required to run. No equipment replacement, except as specifically noted, is identified. All small tools, machine tools, specialized tools, vehicles, and spares, which are now in the plant, or which are normally part of the day-to-day operation of a hydroelectric plant and power transmission line, are assumed to exist and to become the property of the government.

The (nonpotable) domestic water system at Elwha Dam would have to be maintained for fire and sanitary needs. At Glines Canyon Dam, the domestic water system would also have to be maintained. However, the pipeline should operate without major maintenance for the remaining life of the project. Maintenance responsibilities for the roads to each project must be identified. The road to the Glines Canyon powerhouse would require periodic grading and the addition of some gravel material. The physical plant structures at both projects are assumed to be adequate for the remaining life of the project, including the roofing system which would need normal upkeep.

A staff of nine operators is currently required, and would remain essentially the same during the interim period. Major repairs or maintenance, if required, would be by contract. The Glines Canyon powerhouse would be visited daily for inspection and minor maintenance by personnel based at Elwha Dam. Operating costs would remain essentially the same as experienced by the current owner, except that replacements and some maintenance could be reduced. It would probably be necessary to continue maintenance welding for cavitation repair, also by contract.

Both dams would be included in the Bureau of Reclamation's post-earthquake inspection system, the cost of which is nominal. The Earthquake Protection Plans would be periodically reviewed, but no major revisions are anticipated. No Standard Operating Procedures would be prepared to supplement the plant procedures now in place.

B. Option II - Decommissioning Powerplants. Decommissioning of the powerhouses is reasonably straight forward. However, this is not a plan to "moth-ball" the plants. The electrical and mechanical equipment would begin to deteriorate immediately upon shutdown, a process which would continue and, in some cases, accelerate with time. Once decommissioned, the plants cannot be restarted without extensive electrical and mechanical rebuilding. Therefore, salvage or disposal should begin immediately to reduce costs and liabilities.

The rotating equipment, except for the sump pumps and any other necessary equipment, would be permanently de-energized and the lubricating oil removed. Large oil sumps and tanks would be flushed to assure removal of most of the oil. Oil stored in drums in the plants would be removed. The vertical shaft units would be jacked and blocked since the jacking systems (if any) would have to be drained of oil as would the governors. Grease could be left in bearings, such as on the cranes, but any automatic greasing systems would be disconnected, bulk grease containers removed, and the lines purged where possible.

The head gates would be lowered. If there are no penstock and scrollcase drains, the vertical unit butterfly valves would be closed to within a few degrees of sealing and blocked into position, and the wicket gates closed to below 5% and the gate stops run in. This would allow headgate leakage to drain, but would control an accidental headgate opening or failure. If there are drains, the butterfly valve and wicket gates would be closed and the drains opened.

At Elwha Dam, the head gates are operated by water cylinders with pump assist. After the gates are down, the pump would be disconnected and drained of oil. The water cylinders would be valved off and valve handles removed, or the pipes to them removed to prevent unauthorized raising of the head gates. Access to the cylinder blockouts would be locked, although welding the cylinder rods is also possible. Penstock fill gates at Elwha would be closed and welded to prevent leakage. Some of the head gates need repair and could need to be painted. All gate cylinder operating pumps and piping of water would be drained, and heat to the pump house would be discontinued. The trashracks could be left in place.

The head gate at Glines Canyon Dam would be lowered and the power disconnected. The wire rope would deteriorate from prolonged immersion so probably could not be used to raise the gate safely in the future. All oil would be drained as described for the powerhouse. The trash rack structure would be drained of oil and disconnected from power as described above.

All electrical equipment in the powerplants would be de-energized and disconnected from the power source except the heating, lighting, control and instrumentation equipment for the dam, river and lake operations, and sump pumps. Existing substations and transmission lines would also be de-energized and disconnected from the power source. Oil in all electrical equipment would be removed and disposed of to prevent a spill. Any needed power would be obtained from the local utility. If any portions of the equipment in the plants are to be preserved for historic purposes, electric space heaters could be required, along with the continued operation of the ventilation system for moisture control.

At Elwha Dam, the nonpotable domestic water system would be left in operation to supply the toilets and possibly the fire system. Space heaters would be installed (or left in service) in the Elwha Dam control room, as this is assumed to be the office area for the maintenance crew of the decommissioned plant (the only toilet facility in the area is in the powerhouse). The control room is also where the remote gate control communications and most instrumentation are located. Maintenance of the remote gate controls is included under operation of the dam. At Glines Canyon Dam, the nonpotable domestic water system to the crew cabin provides fire protection to the plant and should be left in operation. Both water systems could require periodic flushing.

Generally, inspections would be required to ensure proper operations of the dams and related facilities and because of liabilities. Both the Elwha and Glines Canyon powerhouses would be routinely visited as part of the inspection of the respective dam complexes. Daily visits might not be required, but they were used as the basis for the cost estimates below. Items to be inspected would include plant sump levels, signs of vandalism, increased headgate leakage, operation of the night security lighting, and any instrumentation that would have to be left in service to monitor the pool or the river. The general physical condition of the facility would be assessed periodically, perhaps quarterly. The trashracks are inside the log boom so would not need attention for debris accumulation.

The only frequent maintenance that would be required is adding oil to sump pump bearings and testing the pump controls. An annual inspection of the pump, motor, controls, and electrical system would be done, requiring about one day annually for each powerplant. Another day each would be allowed annually to maintain the instrumentation. At Elwha Dam, the battery system has been assumed to remain active since this is the power source of last resort for the spillway gates. At Glines Canyon, no work would be required on the access road under this option since it can be allowed to deteriorate to a greater degree.

Annual maintenance would be required on equipment that is still in operation such as sump pumps, gates, and control and instrumentation equipment. Minor maintenance of the facilities such as care of grounds, minor painting, grass cutting, and cleanup, would continue. Minor non-periodic maintenance would be required on the facilities such as repair to roofs and repair of sump pumps.

It is assumed the overhead travelling cranes could be used during the decommissioning work, even though they have not had the required load tests. This is based on the further assumption that the loads to be handled are small (500 pounds) compared to the cranes' estimated capacity.

The gates and motors to operate spillway gates would have to be maintained and repaired/replaced on an as needed basis. Secondary items such as gate seals could go without replacement, if the operation was short-term. Major maintenance such as repair/replacement of gate motors would be contracted.

The reservoirs could be operated at one of two levels. One level would be at the normal water surface elevation as operated in the past. The spillway gates could be adjusted periodically to control runoff and maintain this elevation. Some flow augmentation would be possible during dry months. A second operational level would be at the spillway crest elevation about 20 feet lower than the present operation. Under this scenario, the spillway gates would be opened wide over a period of time, to drain the reservoir down to the new level, and left wide open. This would require less attendance as no gate adjustments would be necessary. Flows would be uncontrolled (run-of-the-river) with no flow augmentation during dry months. The possibility of atmospheric gas supersaturation resulting from the increased spilling flow at Glines Canyon Dam and its effects on fish should be evaluated.

C. **Costs**. Operation and maintenance (O&M) costs associated with Option I would be expected to be similar to costs currently incurred by the owner, and are expected to be between $1,200,000 and $1,400,000 annually. The energy produced at the facilities under this option could be sold to defer costs during the interim period. O&M costs associated with Option II would range from $500,000 to $600,000 annually. Costs for decommissioning of the powerplants, substations, and switchyards would be about $500,000.

D. **Conclusions**. Due to the flexibility of present operations (Option I), the condition of the powerplants, and the costs of decommissioning, the facilities could be operated as they are today. The powerplants are in good shape for facilities of this age and should be capable of running for a period of 5 to 10 years with only minor maintenance once they are acquired by the government. Operation by contract rather than by the government appears desirable due to the short remaining life of the project and the learning curve required to become familiar with the existing equipment. Although there are operating procedures available, it is not known how complete they are. Due to the age of the equipment, there are certain to be operational and safety related features that may or may not be documented. Contracting the current plant owners for operation ensures that the staff feels an "ownership" in the plant with the attendant continuity in operation and maintenance.

If the decision is made to decommission, a detailed plan and cost estimate is necessary. The plan should include the salvage of the powerplant, switchyard, and transmission equipment which could offset some of the decommissioning costs. Salvage contracts would have to be awarded as soon as practical to maximize the value of the salvaged equipment and to minimize liability. The reduced liability associated with the immediate removal of oil from the electrical and mechanical equipment must be balanced against the equipment's lower salvage value due to moisture and corrosion. Removal plans and salvage contracting must take into account this tradeoff.

APPENDIX F

DAM REMOVAL AND SEDIMENT MANAGEMENT

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APPENDIX F

DAM REMOVAL AND SEDIMENT MANAGEMENT

I. INTRODUCTION

The following discussion considers methods to remove the Elwha and Glines Canyon dams and restore the river channel. All courses of action presented share the following goals:

- remove the dam structures and all power generating equipment; and
- remove, stabilize, or relocate material trapped in the lake reservoirs since dam construction.

A. DESCRIPTION OF THE GLINES CANYON HYDROELECTRIC PROJECT

The Glines Canyon Hydroelectric Project is located approximately 8.5 miles upriver from the Elwha Hydroelectric Project, near river mile (RM) 13.5. Glines Canyon Dam was completed in 1926 and created Lake Mills, which inundated over 400 acres of land along the river bank. The following are principal features of the Glines Canyon Project:

- a 415 acre, two mile long Lake Mills with 40,530 acre feet of storage at water surface at El. 590 mean sea level (msl); and
- a 210 foot high, 270 foot long concrete arch dam.

Most of the river's total trapped sediment is in Lake Mills, approximately 11.1 million cubic yards (mcy). The lake's delta region contains approximately 7.3 mcy of mostly sand and gravel (hereafter referred to as coarse sediment). The lake itself contains 3.8 mcy of silt and clay sized particles (hereafter referred to as fine sediment).

Additional features of the Glines Canyon Project include the spillway, penstock, powerhouse, and generating equipment. Figure F-1 shows a site plan of the dam and associated structures. Major features of the dam structure include:

- a west spillway section with five spillway bays, each 20 feet wide by 20 feet high;
- a concrete arch section 210 feet high and about 150 feet in length along its crest;
- a concrete thrust block;
- an east bank concrete gravity wall 120 feet in length; and
- embankment sections on both abutments.

The 150 foot long crest of the arch is an ungated ogee spillway at El. 590.33 msl. The gated spillway has its crest at El. 570.33 msl (Table F-1).

The water intake tunnel for power generation (the penstock) is composed of the intake structure, intake gate, tunnel, surface steel pipe, and surge tank. The intake structure for the power tunnel houses the trashracks and trashrack handling equipment. A 12 foot diameter, gunite lined tunnel in rock extends about 200 feet downstream from the intake structure to a caterpillar intake gate in the gate house located in the west abutment. Downstream of the gate house an additional length of about 150 feet of gunite lined tunnel connects to a riveted steel penstock. This penstock is about 450 feet long and extends to the powerhouse. The upper 225 feet of the penstock is located within a rock tunnel. A 140 foot high, riveted steel surge tank is located approximately 100 feet downstream from the tunnel outlet portal.

The powerhouse, located on the bank of the Elwha River, contains one 13,333 KVA, 6.6 Kv generator connected to a 17,500 horsepower, 225 rpm Francis turbine. A hydraulic operated butterfly valve is installed ahead of the turbine to serve as a shutoff valve.

B. DESCRIPTION OF THE ELWHA HYDROELECTRIC PROJECT

The Elwha Hydroelectric Project, initially completed in 1914 at approximately RM 4.9, created Lake Aldwell. The following are principal features of the Elwha project:

- 2 mile long Lake Aldwell with approximately 8,000 acre feet of storage at water surface El. 188 msl;
- a concrete gravity dam, approximately 105 feet high and 450 feet long; and
- dam facilities which include a south bank spillway, the main dam monolith, a north bank power intake, and a north bank spillway.

The reservoir contains approximately 2.6 mcy of trapped material, 1.5 mcy in the delta region and 1.4 mcy in the lake area. This volume is lower than estimated volumes by the Federal Energy Regulatory Commission (see FERC 1993).

Additional project features of Elwha Dam include spillways, penstocks, powerhouse, and generating equipment. Figure F-2 shows a site plan of the dam and associated structures. Major features of Elwha Dam structure include:

- a north spillway section with four spillway bays, each 13.75 feet wide;

- a concrete gravity intake section 131.5 feet in length;
- a gravity dam section about 112 feet in length along its crest and 100 feet in height; and
- the south spillway section with five spillway bays, each 13.75 feet wide.

All spillway bays have been retrofitted with 19 foot high tainter gates. The main dam is a composite section of concrete and embankment fill. The concrete monolith section is supported at its base by bedrock abutments about 40 feet wide. Beneath this base, redeposited sand and gravel extend to the rock contact at a depth of about 80 feet. Upstream of the concrete monolith, and also resting on sand and gravel, is a massive fill of large rock and various other heterogeneous gravel, earth materials, and hydraulically placed fill and blanket materials.

The massive fill upstream of the concrete dam section became a necessary part of reconstruction because of a structural failure of the dam foundation during initial filling. The canyon walls for a distance of 300 feet upstream of the dam provided large quantities of rock which were blasted into the stream. This rock, together with an asphaltic liner overlay, forms the flow resisting barrier for Elwha Dam.

Surface penstocks connect the intakes in the center section of the dam to the generating units in the powerhouse. Each penstock is approximately 190 feet long, and penstocks nos. 1 and 2 are 9.5 feet in diameter. Penstocks nos. 3 and 4 are 11.5 feet in diameter at the intake and join to form a single penstock section of 15 feet in diameter. This single penstock connects with a surge tank, 20 feet in diameter and 120 feet high. Two 8.5 foot diameter outlets connect with the turbine scroll cases.

The original powerhouse is about 88 feet by 87 feet in plan and contains two levels. The concrete surface structure houses two generating units on the lower level. Transformer and switchgear are on the upper level. The second powerhouse addition was built adjacent to the original powerhouse and contains two units.

TABLE F-1
SUMMARY OF PROJECT PRINCIPAL DATA

	PROJECT	
	Glines	**Elwha**
Basin Hydrology		
Average Annual Runoff at Dam Site	1,370	1,760
Mean Annual Flood (cfs)	12,000	18,000
Five-year Construction Flood (cfs)	19,000	25,00
Reservoir		
Normal Maximum Reservoir Elevation (msl)	590.33	195.5
Maximum Pool without Overtopping	600.33	200.0
Surface Area (acres)	415	267
Storage Capacity (acre-feet)	40,530	8,100
Dam		
Earth Embankment		
Crest Elevation (msl)	612.33	180
Crest Length (feet)	175	N/A
Maximum Height above Foundation (feet)	80	85
Estimated Volume (cy)	5,500	110,000
Concrete Gravity		
Crest Elevation (msl)	600.33	198.0
Crest Length (feet)	120	112
Original Streambed Elevation at Dam Site	N/A	95
Maximum Height above Foundation (feet)	30	107.5
Estimated Volume (cy)	2,100	12,800
Concrete Arch		
Crest Elevation (msl)	590.33	
Crest Length (feet)	150	
Original Streambed Elevation at Dam Site	395	
Maximum Height above Foundation (feet)	210	
Estimated Volume (cy)	15,800	

	PROJECT	
	Glines	Elwha
Spillway		
Left Bank Spillway	(West)	(North)
TYPE: Gated Overflow, Concrete Crest		
Bridge Deck Elevation (msl)	600.3	205.0
Bridge Deck Length (feet)	120	82.3
Width of Each Spillway (feet)	20.01	13.75
Tainter Gate Height (feet)	20.0	15.0
Number of Spillway Bays	5	4
Spillway Crest Elevation (msl)	570.33	177.7
Capacity at Maximum Pool (cfs)	63,000	18,700
Estimated Concrete Volume (cy)	2,500	2,900
Right Bank Spillway		
TYPE: Gated Overflow, Concrete Crest		(South)
Bridge Deck Elevation (msl)		205.0
Bridge Deck Length (feet)		90.9
Width of Each Spillway (feet)		13.75
Tainter Gate Height (feet)		15.0
Number of Spillway Bays		5
Spillway Crest Elevation (msl)		177.7
Capacity at Maximum Pool (cfs)		23,300
Estimated Concrete Volume (cy)		1,550
Penstock		
Invert Elevation of Control Sill (msl)	503.33	173.0
Hydraulic Capacity When Generating at Normal Maximum Pool (cfs)	1,100	2,000
Hydraulic Capacity with Fixed-cone Valve Addition at Normal Maximum Pool (cfs)	5,000	N/A

	PROJECT	
	Glines	Elwha
Powerhouse		
Normal Tailwater Elevation (msl)	395	93
Estimated Concrete Volume (cy)	1,600	7,000
Transmission Line		
TYPE:		
Voltage (kV)	69	69
Length (miles)	7	7

C. ELEVATION DATUM

Different vertical datums were used for the original construction of the Glines Canyon and Elwha projects. Elwha project construction was initiated in 1913 and Glines Canyon project construction began in 1926. Each project established its own vertical control datum at the time of construction, and the datums are not consistent with each other.

Elevations for the Elwha Project, recorded on as-built and report drawings, are 8 feet lower than the National Geodetic Vertical Datum (NGVD) of 1929. Conversely, Glines Canyon Project as-built and report drawings have an established project datum that is 19.67 feet higher than the NGVD datum. Recent soundings of Lake Mills and reaches of the Elwha River have used the NGVD datum.

In addition to the datums' inconsistency with each other, neither is mean sea level. This use of multiple, nonstandard datums has caused considerable confusion. For clarity, this report relates all project feature elevations to the NGVD datum, which is referred to as mean sea level (msl). References made to project datum elevations will be noted.

II. RIVER RESTORATION ISSUES

The common goals of restoration considered for all investigations were the complete removal of the dam structures (termed *Dam Removal* in this report) and removal, stabilization, or relocation of material (termed *Sediment Management* in this report) that has accumulated in the reservoirs since dam construction. Each approach to the goals of dam removal and sediment management required an investigation of the following major issues:

Dam Removal

- creation of a path to divert the river during demolition activities, to remove water pressure from the dam;
- removal of concrete debris and earthen structures that block the path of the river;

Sediment Management

- creation of a channel for river flow through portions of the lakebed areas where large quantities of material have been deposited; and
- removal, stabilization, or relocation of material trapped in the lakebed areas since dam construction.

Effects on downriver water users were a major consideration in development of feasible approaches. Continued water use by all current users during and after the construction process was assumed. Not all approaches discussed below provide acceptable water to all users during the construction process. If water quality were degraded by the construction process, mitigation measures (see Section VI(E)) would be necessary. Several generalized approaches are presented for both dam removal and sediment management. Other sections discuss issues relating to requirements of downriver water users and revegetation.

III. DAM REMOVAL AND RIVER DIVERSION ALTERNATIVES

Four approaches to dam removal and river diversion were investigated (*Dam Removal*). Each was developed into a plan that would allow control of reservoir levels during the sediment management process:

- tunnel diversion around the dams (*Plan 1*);
- surface channel diversion (*Plan 2*);
- low level, through-the-dam diversion (*Plan 3*); and
- top-down, notch-in-dam diversion (*Plan 4*).

The four plans were developed to the feasibility level and each is briefly discussed, with its associated cost estimate for comparison.

A. DAM REMOVAL DESIGN CRITERIA

Because of the absence of new structures in a demolition project, its design criteria are limited. Nonetheless, design criteria are important especially as they relate to worker safety and predictability of the dismantling process. Both Glines Canyon and Elwha dams are classified by the Federal Energy Regulatory Commission (FERC) with a high hazard potential. Design criteria used for these investigations include the (1) capability to divert river water during construction and (2) promotion of dam structural stability during overtopping in a flood event. All options investigated meet both criteria.

As part of a FERC safety inspection, Elwha Dam was previously evaluated for passage of a probable maximum flood and was determined to be stable. Demolition of Elwha Dam under *Plan 2* (diversion channel through the north abutment spillway) would occur only when the reservoir has been lowered to river level. Consequently, demolition and removal of concrete rubble would occur during low risk conditions. In addition, concrete would be removed from the top down, and disruption to the work area would occur only during floods greater than a 1-in-10-year event.

Diversion plans using diversion tunnels are low risk approaches to dam removal because the reservoir would be lowered to river level before the dams are dismantled. Also, the concrete structures would be removed from the top down so that, should there be a flood greater than the capacity of the diversion tunnels, the structure would be sound during overtopping.

To ensure worker safety during a flooding event, an early warning detection system could be installed in the basin. A stream gauge in the upper basin with a telemetering system to the work area would be designed to provide several hours warning of an impending increase in flood flows. This system would allow workers and equipment to be evacuated from areas subject to flood hazard. Flood criteria for design of river diversion systems at both dams are discussed in the following section of this report. The Washington Department of Ecology, Office of Dam Safety, and the Army Corps of Engineers will be further consulted on safety issues during the advanced planning stage.

B. RIVER DIVERSION DESIGN CRITERIA

The demolition plan must be able to pass a flood that might be expected during the process and it must not compromise worker safety or the dam's structural integrity. Ideally, any diversion option would be able to divert the peak flow anticipated to occur during the period of operation. However, the construction cost necessary to provide a diversion large enough to pass the maximum flow anticipated during the demolition process would be significantly greater than providing for diversion of a reduced flow that would occur only 10% of the time.

Average daily flows at the McDonald gauge station were computed to be approximately 1,500 cfs. Average daily flows exceeding 5,000 cfs would be exceeded only for short periods of time during the construction process, approximately 10% of the time. Based on these considerations a criteria of 5,000 cfs was chosen as the design criteria for diversion flow. Passage of larger flows can be accomplished by storage or by ensuring that flood waters overtop the intact dam and that partially demolished dam sections be structurally stable if overtopped.

For a construction period of one year duration, it is normal practice to provide for safe passage of a five- or ten-year frequency flood event. According to R.W Beck's "Periodic Safety Inspection Report, Elwha Hydroelectric Project" (October 1968), the five-year flood instantaneous peak at Elwha Dam is estimated to be 25,000 cfs. The five-year flood instantaneous peak at Glines Canyon Dam, according to Beck's "Periodic Safety Inspection Report, Glines Canyon Hydroelectric Project" (February 1967), is estimated to be 19,000 cfs. The five-year peak flood estimate is based upon recorded discharges at McDonald Bridge as adjusted for area and elevation to reflect flows at either dam in accordance with data contained in USGS Water Supply Paper No. 1687. Fifty-one years of recorded flows were used in the analysis (1898 to 1902, and 1920 to 1965).

Provisions to pass 25,000 cfs through diversion works at Elwha Dam and 19,000 cfs through diversion facilities at Glines Canyon Dam are considered to be unnecessarily costly. A more appropriate requirement to determine diversion outlet capacity is to allow capacity exceedance for a few days per year, providing this can be done without risk to worker safety or to the dam's structural integrity. Demolition work could be suspended during flooding events and resumed when lower flows return. In any case, a demolition plan must be able to safely pass the five-year flood without compromising worker safety or the structural integrity of the dam.

Safe flood passage invariably means that either the existing spillways must remain intact during the season when floods of a five-year magnitude can occur or that lowered dam sections would be structurally stable if overtopped. Dam demolition work likely would be scheduled from June through October to avoid periods of high flow risk. A review of gaging station flow records at the McDonald Bridge indicates that 5,000 cfs is an appropriate design capacity for diversion works at either dam. This is because flows greater than 5,000 cfs would likely occur only for a few days during the construction period, and they can be safely discharged even though overtopping may occur. Following is a summary of the principal features of the Glines Canyon and Elwha projects.

1. **PLAN 1 - DIVERSION TUNNEL:** For this plan, diversion tunnels would be used in the dam demolition process. The tunnels would divert the river from the dam demolition site to allow construction activities to be conducted under dry conditions. The primary advantage to tunnel construction would be that it offers control of reservoir levels. The primary disadvantage would be higher cost. Diversion tunnel options were investigated and would be feasible at both dam sites. However, the specific

geology of these sites has not been investigated and assumptions were made in the assessment of feasibility.

Glines Canyon Dam. Construction of a diversion tunnel through either abutment is feasible. However, for this alternative, the diversion tunnel is assumed to be constructed in the west abutment. The tunnel inlet would be located near the existing power tunnel intake and would exit about 100 feet downstream of the powerhouse on the Elwha River. A cofferdam constructed just upstream of the outlet would permit construction of a haul road to the base of the dam. This road would provide access for construction equipment during demolition of the concrete arch structure. Figure F-3 shows the site plan and profile of the diversion tunnel arrangement.

The diversion tunnel would be approximately 800 feet long and would have a concrete lined inside diameter of 13 feet. The principal elements of the diversion tunnel are the lake tap, gate shaft with bonnetted gate, the tunnel itself, and energy dissipating structure. The lake tap would provide for a surface level inlet to help minimize turbidity of diverted flows. The bonnetted roller gate, measuring 13.6 feet high by 9.7 feet wide, would provide for control of discharges up to 5,000 cfs. The energy dissipation structure would prevent outlet discharges from scouring the river bank. If allowed to occur, this scouring would increase the turbidity of river flows.

The tunnel would require extreme care during construction because it would be constructed with the reservoir nearly full. Sufficient rock cover would be required as the tunnel is excavated toward the lake to prevent rupture and uncontrolled diversion. For this study, the overburden is assumed to be competent rock. After tunnel construction is complete, with the bonnetted gate installed and the energy dissipator constructed, the lake tap construction would commence. A shaft would first be excavated directly above the tunnel end. Because the shaft would be excavated in water, first an 18 foot diameter caisson would be sunk at the shaft location. A 2 foot diameter pilot hole would be drilled at the shaft centerline and a 16 foot diameter shaft would be excavated within the caisson, using the raise-bore technique.

With the completed diversion tunnel, river flow and reservoir drawdown discharges bypass the construction work area. As the reservoir is drawn down gradually, controlled blasting and removal would be required of the rock wedge that separates the lake from the shaft. Care must be taken when removing the rock wedge not to plug the tunnel with large quantities of material. Controlled blasting and removal of the rock wedge would be undertaken in 10-foot stages. The rate of removal of the wedge would progress similarly to the rate the reservoir is drawn down, so as to selectively withdraw water from the surface where turbidity is less than expected deeper in the pool.

Elwha Dam. Figure F-4 shows the site plan and profile of the diversion tunnel arrangement. The first stage of construction would use the north spillway to regulate river flows and control the reservoir pool level between normal maximum pool El. 195 msl and El. 180. During this stage, dredging and mechanical removal operations would proceed in the upper reservoir area. Tunnel construction and powerhouse and penstock structural demolition and removal would occur at the dam. When the diversion tunnel has been completed, the diversion tunnel would be used to control reservoir elevations below El. 180 to streambed (approximately El. 105).

Construction of a diversion tunnel on either abutment is considered feasible. For this plan, the diversion tunnel would be constructed in the south abutment because access for excavating the tunnel is more practical from the south side. Additionally, the south side abutment area appears to be more desirable for excavating the intake portal (lake tap) in rock. The tunnel inlet would be located upstream of the fill material behind the concrete gravity structure. It would exit a point about 250 feet downstream of the dam. An additional 220 foot pipe extension would convey the water beyond the downstream cofferdam.

The diversion tunnel would be approximately 900 feet long and would have a concrete lined inside diameter of 13 feet. The principal elements of the diversion tunnel are the lake tap, gate shaft with bonnetted gate, the tunnel itself, and energy dissipating structure. The lake tap would provide for a surface level inlet to help minimize turbidity of the bypass flows. The bonnetted roller gate, which measures 13.6 feet high by 9.7 feet wide, would provide for control of discharges up to 5,000 cfs. The energy dissipation structure would prevent outlet discharges from scouring the river bank, which would increase the turbidity of river flows.

2. PLAN 2 - SURFACE DIVERSION CHANNEL: Both the surface diversion and the notched approach investigate methods of lowering reservoir levels so that portions of the dam above these levels can be demolished in the dry. Water pressure on the back of the dam would remain as the dam is removed from the top. Because the loads on a dam will reduce more rapidly as its reservoir level is lowered, than will the dam's ability to resist the loads, this approach was considered feasible.

The major advantage to this approach would be the potential for reduced construction cost when compared to the tunnel approach. A disadvantage would be that the ability to raise reservoir levels, if desired, would be lost after demolition began. Raising and lowering reservoir levels would only be an advantage in sediment management scenarios using the *Erosion* approach. Other sediment management approaches do not benefit from the ability to raise and lower the reservoir.

Glines Canyon Dam. Creation of a river surface diversion at Glines Canyon Dam was investigated for use in conjunction with the existing power tunnel. However, difficulty with construction staging and cost make this approach unfeasible.

The proposed channel would extend for about 9,000 feet on the west bank along the 540 elevation contour. It would connect the river in the upper reservoir to the existing power tunnel. A cofferdam would divert river flow into the channel. The remaining reservoir area could then be lowered slowly through the existing outlet to El. 450 msl. Below this elevation, water would be allowed to discharge over the dam in ungated notches of nominal depth (say two-feet deep). An advantage of this diversion alternative is that the finer sediments in the reservoir could be dredged without affecting the turbidity of the flow passing downstream.

A disadvantage of this alternative is that the channel, with invert elevation of about El. 540, could be constructed only after the reservoir is lowered to about El. 535. First stage diversion through the existing power tunnel would be utilized to lower the reservoir pool. Work on the reservoir dredging would be deferred for several months until the completion of the diversion channel. Also, construction of the portion of the channel that connects with the power tunnel headworks would require that the tunnel be taken temporarily out of service. Consequently, a new low level outlet of sufficient capacity would be required temporarily to lower the reservoir sufficiently to permit completion of the channel diversion facilities. Finally, when the diversion channel is completed and ready for operation, the river would be diverted back into the channel and thence through the existing power conduit.

Reference to a Bureau of Reclamation reconnaissance-cost curve for channel excavation indicates the diversion channel would probably cost between $40 million and $90 million. The actual cost would depend upon diversion capacity and the extent of rock excavation. The lower cost reflects 3,000 cfs diversion capacity with common excavation conditions. The higher cost reflects 5,000 cfs diversion capacity with 20% rock excavation. Both costs assume the channel would be unlined, which is appropriate for temporary diversion facilities.

Because the work areas on both the downstream and upstream sides of the dam would be in the dry, conventional drill and blast techniques could be employed in the demolition of the dam. Therefore, some reduction in dam demolition cost would result. The reduction, however, would not be sufficient to offset the much higher river diversion costs as compared to the notch plan and the enlarged low level outlet plan.

Elwha Dam. Diversion of the Elwha River via a channel excavated through the north abutment is considered technically feasible. However, due to limited data, the plan for the present study is based on broad assumptions with respect to area topography, reservoir configuration, and geologic site conditions. Improved definition of these factors through field surveys and geotechnical investigations is necessary. These investigations would provide the basis to more accurately define and quantify the bid items for construction, thereby improving cost estimates.

This plan for diversion incorporates three stages as shown in Figures F-5 through F-9. The first stage would use the existing powerplants and, if necessary, the south spillway. The second stage would divert through a channel in the north abutment spillway. The third stage of diversion would restore river flow through the natural river channel.

a. First Stage Diversion. The purpose of first stage diversion is to lower the reservoir about 14 feet below normal pool to permit construction of second stage diversion facilities. During first stage diversion, water would pass through the powerplants and the south spillway. Figure F-5 illustrates the initial step. Flow rate and reservoir level would be controlled through the operation of the powerplant and five spillway gates. No structural modifications are necessary. The powerplants have a hydraulic capacity of 2,000 cfs. The intake sill is at El. 173. The south spillway section is 90.9 feet long and extends from the main dam section to the south abutment. The spillway contains five bays, each 13.75 feet wide, and each concrete sill is at El. 177.7 msl (equivalent to project datum El. 169.7).

At pool El. 200 msl (project datum El. 192), two feet above the dam crest, the south spillway will pass the estimated five-year flood event of approximately 25,000 cfs. About 5,000 cfs can pass through the south spillway at pool El. 185 msl.

When the reservoir has been lowered to about El. 185, the cofferdam as shown in Figure F-6 would be constructed, with its crest at El. 186. At this pool elevation, water would pass only through the south spillway. The cofferdam, located about 300 feet from the north spillway, would extend from the north bank of the reservoir for approximately 150 feet, then wrap around into the reservoir rock outcrop as shown in Figure F-6. From topographic soundings of the reservoir, the rock outcrop appears to be as high as El. 190, or about five feet below normal maximum pool level. An additional closure cofferdam would dike off flows around the inside of the existing intake. The cofferdam would be a rockfill structure with a 15 foot wide crest and sideslopes of 1.5:1 and approximately 150 feet long. Approximately 5,300 cubic yards of fill must be quarried and placed for this cofferdam design. A single line of sheet pile through the centerline of the crest driven to El. 128 would provide seepage control if it can be installed. Otherwise, a more appropriate cut off would use upstream face sand filtering material and geomembrane. Reinforced matting would be installed at the downstream toe section to control its erosion. The cofferdam would provide one foot of freeboard at a discharge of 5,000 cfs.

With reservoir inflow passing through the south spillway, the first stage diversion would permit dismantling the north spillway gates, demolition and removal of the north spillway concrete crest structure down to rock, and excavation of much of the diversion channel. Figure F-6 illustrates this second step.

b. Second Stage Diversion. In this stage, water flows through the channel on the left abutment. Second stage diversion features will permit progressive lowering of Lake Aldwell to about El. 135. During this phase the following work activities would be performed:

- demolition and removal of the main concrete gravity section, the hydraulic fill embankment behind the concrete section, the adjoining south spillway and the intake monolith sections;
- demolition and removal of the penstock and powerplants; and
- restoration of the Elwha gorge in the dam area.

These activities would all be performed in relatively dry conditions. The diverted river would be directed into the newly excavated channel passing through the north abutment and would bypass about 1,000 feet of streambed to the south. A second cofferdam would be constructed in the river channel immediately downstream of the powerplant tailrace. This cofferdam would prevent diversion backwater from entering the work area in the river reach immediately downstream of the main dam monolith section.

As noted above, the diversion channel would have been constructed during first stage diversion, except for the removal of the cofferdam and its underlying rock plug, both located near the entrance to the newly constructed channel. Incremental removal of the cofferdam would permit the reservoir pool level to be lowered gradually with the overflow portion of the cofferdam functioning as a hydraulic control. The cofferdam would be dismantled from the top down and performed by draglines. The height of each lift to be removed from the top would depend on the pool level requirements of the dredging operation for sediment management in the upper reservoir delta. Should the reservoir level need to be raised, heavy rock fill could be placed back on top of the cofferdam to increase its effective crest elevation. Figure F-7 shows a portion of the cofferdam removed with pool level at El. 170 msl.

After the cofferdam has been removed, the rock plug would be notched in stages to allow further lowering of the reservoir. The rock plug would be shot first on the north side of the channel. Then, its removal with drag lines from either shore would form a notch through the rock plug. This procedure would continue to alternate channel sides at a rate consistent with the reservoir delta dredging operation. Finally, when the reservoir has dropped from El. 182 to about El. 140 msl, a second reservoir cofferdam would be constructed to cut off flow through the main dam, as described below. Reservoir outflow would continue to be conveyed through the diversion channel described above. With flow cut off, the upstream dam embankment could be removed with only minimal amounts of seepage.

The second stage cofferdam would consist of a single line of sheet piles driven into the riverbed in the upstream end of the existing embankment section where shown in Figure F-8. The distance of the cofferdam sheet piles from the main dam would be about 400 feet. Once in place, demolition and removal of the main dam concrete section would commence. Construction access to dispose of concrete and other materials would be a new south abutment haul road located near the downstream toe of the dam. Following demolition and excavation activities for the main dam section, the original river channel would be restored and the banks revegetated.

c. **Third Stage Diversion**. Third stage diversion would include removal of the remaining cofferdams. The river would be returned to its natural channel. Figure F-9 illustrates the restored channel at the dam site.

3. **PLAN 3 - LOW LEVEL DIVERSION THROUGH DAM STRUCTURE:** A "low level" outlet was investigated as an option to diverting the river as a means of lowering the reservoirs. The low level concept would allow water to pass through the dams near the bottom of the structure, rather than allow it to pass over or around them. Glines Canyon Dam was constructed with a small outlet containing a valve near the bottom of the structure. This valve has most likely never been used. Due to the nature of dam construction, a low level outlet through the structure is feasible only at Glines Canyon Dam. Earth fill behind the concrete structure at Elwha Dam precludes this approach.

Plan 3 is comprised of three diversion stages, with the low level outlet as the primary diversion stage. Stage 1 would use the existing powerhouse to regulate flow until the low level outlet enlargement was completed. The west spillway could also be used, but the spray from its discharge would interfere with low level outlet construction. The low level outlet would permit lowering of the reservoir to about El. 460. The final stage of diversion, which would permit lowering of Lake Mills to streambed, uses gated notches in a progressive stepped approach. This third stage diversion approach is described in detail under *Plan 4*.

Diversion is feasible through an enlarged low level outlet that would be aligned with the existing low level outlet. The existing 5 foot diameter opening would be enlarged to 13 feet for installation of a 10 foot diameter conduit through the dam. A 117 inch diameter, fixed-cone valve would permit discharges through the low level outlet of about 5,200 cfs at pool El. 590 msl and about 1,400 cfs at pool El. 460 msl. Figure F-10 shows a sectional view of the enlarged low level outlet arrangement. Figure F-11 presents a discharge rating curve through the 117 inch fixed-cone valve.

The existing outlet is at about El. 450 msl. Although it is 60 feet above the riverbed (El. 390), it is considered impractical to locate the new outlet significantly lower in the dam. This is because the sediment level on the upstream face is near the invert of the existing outlet, and placing a gate structure below the sediment level would be too difficult.

Construction of an enlarged hole through the dam would alter stress concentrations in the structure. A finite element method (FEM) analysis was conducted to examine the state of altered in situ stresses of the dam. The results indicate that a 10 foot diameter conduit constructed through the arch dam would not overstress the concrete or cause a rupture of the structure. Details of the FEM analysis are presented below.

a. Finite Element Model (FEM) Analysis. The objective of the FEM analysis is to determine the effect of an enlarged hole on the distribution of stresses within the dam. The analysis was performed for a hole 13 feet in diameter, rather than the final diameter of 10 feet, as required hydraulically. Previously, as reported in Harza Engineering Company's "Sixth FERC Inspection and Safety Report" (February 1992), a finite element model was developed to analyze the effects of earthquakes on the dam. The material properties assumed in the previous FEM analysis are based on the average compression tests of 20 core samples and have been adopted for use in this report. These are as follows:

Concrete	
Compressive Strength	5,984 psi
Tensile Strength	760 psi
Unit Weight	150 pcf
Modulus of Elasticity	3.1×10^6 psi

The foundation modulus of elasticity in the previous study was assumed to be equal to the concrete modulus. However, based on the geotechnical discussion in Reference 3 and the universal presence of joints in the foundation rock, the modulus of the foundation rock for the FEM analysis was assumed to be two-thirds of the concrete modulus. The tensile strength of the concrete is estimated to be 760 psi and is derived from the measured average compressive strength, using Raphael's procedure described in Reference 6.

For the purpose of this analysis, the water loading assumption was that the reservoir would be at spillway crest El. 570. This scenario assumes that demolition of the dam would not commence until after the new outlet is constructed. Once demolition begins, the crest would be rapidly lowered to about El. 515 msl.

Concrete temperature loadings were based on estimates of Harza's "Sixth FERC Inspection and Safety Report". These assumptions are conservative because construction activities and a lowered reservoir would reduce the linear temperature loading. With water removed from the upstream face, concrete temperature on the upstream face would be about the same as the temperature of the downstream face. Therefore, thermal loading would be less than estimated in the Harza Safety Report.

The Harza study used 51 solid elements to model the dam for dynamic effects. Because the Beck study focuses on static stress concentrations, 880 solid elements were used. Figure F-12 shows a view of the model from the downstream side. Foundation elements are shown in a darker shade. Figure F-13 shows constraints applied to the foundation element nodes. Figure F-14 shows hydrostatic loading up to El. 570 msl applied to the upstream face.

The first step in performing the FEM analysis was to determine the magnitude and direction of structural deflections. Calculated downstream deflections are shown in Figure F-15, measured in feet. The deflections shown are less than those estimated in the FERC safety inspection report, but are consistent with the lower reservoir pool elevation used in the Beck study.

The maximum principal stresses occur on the downstream face of the dam. Stress contours are shown in Figure F-16, which identify areas of tension, the principal concern for arch dams. The contours shown are measured in kips per square foot (1 ksf = 6.94 psi). The highest tensile stresses are found in the area around the opening. The maximum tensile value of principal stress is 338 psi. The region where tensile stresses are between 177 psi and 338 psi is small. Also, stress contours are shown in the cross sectional view in Figure F-17.

b. Calculated Stresses and Factor of Safety. Calculated regional principal tensile stresses of 330 psi around the opening of the outlet conduit are acceptable because the model shows they would occur in a relatively small region. Comparing the calculated maximum regional stress (330 psi) in the concrete to the calculated maximum tensile strength of the concrete (760 psi), the factor of safety is estimated to be 2.2. If the effect of maximum temperature differences are added to the stresses in the concrete (using results from the FERC safety inspection study), then the safety factor is reduced to about 1.5. This factor of safety is considered adequate since this is a construction condition and inclusion of the effects of maximum temperature differences is conservative.

The results of the FEM analysis demonstrate that construction of a 10 foot diameter outlet through the existing outlet at El. 450 msl in Glines Canyon Dam is technically feasible, based on the reported strength of concrete in the dam.

c. **Method of Removal**. As noted, the power tunnel and the west spillway would be used during first stage diversion until the low level outlet modification is complete. The low level outlet would permit lowering of Lake Mills to El. 460. As the reservoir is lowered by either the power tunnel or low level outlet, the concrete from the arch structure would be removed from the top down, by workers and equipment on barges. An alternate demolition procedure might use a boom crane from one abutment. The rubble would be disposed in the upper reservoir via a haul road. Below El. 460 msl the reservoir would be lowered via diversion notches, described in detail under *Plan 4*.

The location of the new outlet through the arch dam assumes that sediment has accumulated at the upstream face to approximately the invert (El. 448 msl) of the existing low level outlet, which functions as a sluiceway. Existing mapping of the reservoir bottom seems to substantiate that sediment deposits are near the outlet invert. The new enlarged outlet anticipates a 117 inch diameter fixed-cone valve which would replace the existing 5 foot butterfly valve. A bulkhead would be installed by divers initially on the upstream dam face. Because the bulkhead cannot be installed below the top of the sediment, the enlarged hole would be located slightly above the sediment bed.

A 13 foot diameter hole would be cut with a closely spaced ring of 6 inch diameter holes drilled around the circumference of the outlet hole. A 10 foot diameter steel pipe would be grouted into place through the hole. The resulting low level outlet conduit would permit regulation to achieve the desired discharge from the reservoir, based on the degree of gate opening. Should reservoir inflows occur that are greater than the outlet capacity of the fixed-cone valve, the reservoir level would rise. However, the dam would remain stable even with water at the dam crest.

One drawback of the low level outlet is that the new opening at El. 450 msl is about 60 feet above the riverbed. Consequently, this alternative would require a third stage diversion that incorporates notches through the dam for the final draining of the reservoir. A description of the notch diversion scheme as a separate alternative is provided in the following section for *Plan 4*. In conjunction with the low level outlet plan described above, the notch diversion scheme would be used only below the elevation of the new outlet.

4. PLAN 4 - NOTCH THROUGH DAM, TOP DOWN REMOVAL: The "notch" approach was investigated as an alternate to the low level or diversion concept. This approach allows water to pass through a gated notch in the dam structure, which would lower the reservoir level. After lowering, portions of the structure above the reservoir water level would be demolished and removed. The major advantage to this approach would be a potential cost savings when compared to the tunnel diversion approach. *Plan 4* is feasible only at the Glines Canyon Dam. Earth fill behind the concrete structure at the Elwha Dam precludes notching through the structure.

Plan 4 is composed of four diversion stages. A series of notches through the concrete arch is the primary diversion stage. Stage 1 would use the existing west spillway to regulate flow through its gated spillway until the power tunnel has been appropriately modified. The spillway would permit lowering of Lake Mills to about El. 575. Flow through the power tunnel would permit lowering to about El. 515. Below El. 515 to streambed, diversion notches under stage 3 would be used. Finally with the river stored to its channel, the remaining concrete in the arch structure at the river level would be removed as appropriate.

Diversion of the Elwha River through notches in the arch dam is technically feasible. A stability analysis was performed of the dam structure. A 25,000 cfs flood was assumed to flow through a 17 foot wide by 25 foot deep notch, with 15 feet of surcharge over the dam crest. For this analysis, flow through the power tunnel was ignored and the structure was viewed as two components. The first component is the portion of the structure below the sill level of the notch and the other is above the sill level. The concrete structure below the notch was assumed to retain its arch action against the loading induced by the reservoir, so was not analyzed further. The portion of the structure into which the notch is cut loses its arch support so was analyzed in more detail. Glines Canyon Dam contains a significant amount of reinforcing steel which is placed vertically, diagonally, and in both horizontal directions. The steel will tie the two portions together after cutting notches. Nevertheless, the notched portion of the structure was analyzed conservatively for structural stability, assuming that it is a non-reinforced concrete member.

Analysis shows that in the worst case loading scenario, the structure will not fail from hydrostatic loading, nor from the pressure induced by the flowing water. Over an extended period of over-topping, however, significant quantities of concrete near the corners of the portion above the notch will be worn away or break off due to the high-velocity turbulent flows. As a result, there is a risk of failure due to chunks of concrete breaking out of the corner on which the slide gate is mounted. This risk of erosion would be minimized, and possibly even eliminated, by epoxy grouting and by the relatively large amount of reinforcing steel which laces throughout the dam section. The four stage diversion process under *Plan 4* is described in more detail below.

a. **Stage 1.** The existing spillway gates would be used to lower the reservoir by about 15 feet or until the power tunnel has been modified for higher discharges. No structural improvements to the spillway are necessary. As noted, the spillway contains five gated spillways each 20 feet wide by 20 feet high. The crest elevation of the ogee control sill is El. 560.33 msl.

b. **Stage 2.** The power tunnel would be used during second stage diversion to lower Lake Mills to pool El. 515 msl. Figure F-18 shows the sectional view of the existing power tunnel headworks. The hydraulic capacity of the tunnel could be increased to about 5,100 cfs, or the approximate equivalent to the low level outlet capacity under *Plan 3*. This increase requires removal of the turbine runner and wicket gates, modification of the water passageway through the scroll case to an 11 foot diameter conduit, and installation of a fixed-cone valve for free discharge. Figure F-19 illustrates the proposed modifications to the powerhouse water passage to install the fixed-cone valve. Figure F-20 shows the discharge rating curve.

A less costly approach would be to only remove the turbine runner and control flows with the existing wicket gates and allow the discharge to continue through the draft tube. However, by this method the hydraulic capacity of the tunnel would be increased to only approximately 2,700 cfs. With additional, fairly minor, modification work to the turbine scroll case and draft tube, the capacity of the power tunnel would increase to about 2,900 cfs at pool El. 590 msl. A discharge rating curve of each variation is shown in Figure F-21.

During demolition of diversion stages 1 and 2, the arch dam from El. 590.3 to El. 540 would be removed in sections from barges, as further described in Section 4 below. At El. 540, the crest length of the concrete arch structure is reduced from 150 feet to about 120 feet. About 70 feet of the crest would be stepped down by 12.5-feet increments to El. 527.5. The remaining crest length of 50 feet would be at El. 540 and is vertically aligned with the location of the initial notch of stage 3 diversion.

c. **Stage 3**. The third stage diversion would commence once Lake Mills is lowered to pool El. 515 msl (equivalent is project datum El. 535). The crest elevation of the concrete arch would be lowered to two levels at El. 540 and El. 527.5, as described in stage 2. Before the initial notch can be made within the El. 540 block, a bulkhead would be installed to create dry conditions for removal of the concrete in the area to be notched. Figure F-22 shows the concept of the bulkhead design. The notch would be 17 feet wide by 50 feet deep and approximately 20 feet thick. Its sill elevation would be 490 ft. msl. Of the 50 foot depth, about 25 feet would extend below reservoir pool level. The upper 12.5 feet of dam remaining adjacent to the notch on each side provides a structural face from which to fully raise the gate to the open position.

After pumping out the water, closely spaced holes drilled into the concrete would be charged and shot to demolish the concrete within the area confined by the bulkhead. Then a backhoe would be used to remove the concrete. The rough surface of the notched area could be lined with shotcrete to create a hydraulically smooth surface. The bulkhead mounted on the upstream dam face would permit installation of gate guides, seals and seat for the slide type gate. A hydraulic cylinder operating system would also be installed. Figure F-23 shows the detail of the slide gate design.

Once the gate is installed, the bulkhead can be safely removed. Then the diversion system would become operational for controlled lowering of the reservoir by about 10 to 20 feet, or to approximately El. 515 to El. 500, depending on reservoir inflow. The notch could be sized to pass up to 9,000 cfs without overtopping the crest El. 527.5. However, inflow into Lake Mills is normally less than 1,500 cfs. Consequently, when the pool has been lowered to about El. 500, discharge through the notch would be equivalent to average reservoir inflow. When the gated notch does not permit further lowering of the reservoir, the gate and operating system would be removed, and the second of nine successive planned notches would be constructed. The second notch would be located sufficiently far to the right of the initial notch so that unacceptable stress levels would not occur. The gate guide and sill would be removed when the pool level is lowered below El. 490 through the next successive notch.

The sill elevation of each notch would be 12.5 feet lower than the preceding notch. Before the second notch is constructed, a portion of the dam crest would be removed such that 50 feet of the crest length would be at El. 527.5 and the remaining sections at 515 msl. The high portion is left at the location where the next notch would be cut. One notch would be required for each 12.5 feet (vertical) of dam removed, so nine notches would lower the crest a total of 100 feet to El. 427.5. The dam crest and notch sill elevations for each succeeding notch are listed in Table F-2.

Table F-2. Notch sill elevations.

Notch No.	Gate Operator Elevation[1]	Dam Crest Elevation[2]	Notch Sill Elevation	Notch Location
1	540	527.5	490.0	Left side of dam
2	527.5	515.0	477.5	Right side of dam
3	515	502.5	465.0	Left side of dam
4	502.5	490.0	452.5	Right side of dam
5	490	477.5	440.0	Left side of dam
6	477.5	465.0	427.5	Right side of dam
7	465	452.5	415.0	Left side of dam
8	452.5	440.0	402.5	Right side of dam
9	440	427.5	390.0	Left side of dam

[1] A 50-foot length of dam crest remains at this elevation prior to cutting the notch.

[2] Elevation prior to cutting notch.

All notches would provide the same 17 foot wide by 25 foot deep gate opening. This would allow the bulkhead cofferdam and slide gate used for the first notch to be reused on all successive notches.

d. **Stage 4**. Because the invert elevation of the last notch is at streambed elevation (approximately El. 390 msl), the river cannot be lowered. Also, the gorge is too narrow to divert the river any place other than through the notch. Consequently, removal of the remaining concrete blocks on either side of the river would be carried out under wet conditions. This operation is more effectively performed during low flows. If the river were passing about 500 cfs, which is common during summer months, the stage level over the notch invert would be 5 feet. With the river flowing through its original channel, maneuverability of a barge in the narrow gorge would be very difficult. Therefore, Stage 4 demolition would not use a barge, and installation of a cableway or boom crane would be necessary to remove the remaining concrete blocks out of the gorge.

C. SCHEDULES

The schedule prepared for this study assumes that the reservoir sediment dredging operation and the demolition of structural dam components would proceed concurrently. With this concept, both Elwha and Glines Canyon dams would be removed in an 18 month period. Following are brief descriptions of the schedule for the two proposed dam removal plans. Figures F-24 and F-25 are Gantt charts of each plan, and illustrate task activity interrelationships and durations. For Glines Canyon Dam removal, the diversion notch alternative was used to prepare the schedule.

1. **SCHEDULE FOR GLINES CANYON DAM REMOVAL:** The estimated total time required for dam removal is 18 months from award of the valve procurement contract to completion of site restoration. Figure F-24 presents a Gantt chart of the planned schedule for removal of this dam. Complete demolition of Glines Canyon Dam and related structures requires three diversion stages. Stage 1 provides diversion of reservoir inflow through the existing gated spillway and can draw down the reservoir to pool El. 575. In stage 2, flows are diverted through the power tunnel, which can draw down the reservoir to pool El. 515. Stage 3 diverts flows over notches in the arch dam and can draw down the pool to the original streambed.

The demolition program would remove the dam and restore the site over a 12 month period. An estimated six month lead time, however, is required for delivery of the fixed-cone valve which is necessary to regulate second stage diversion flows. In addition, delivery of a slide gate and a bulkhead cofferdam would require sufficient fabrication lead time before third stage diversion can start.

Following the contractor's mobilization, the powerhouse water passage could be rebuilt with an 11 foot diameter discharge outlet to regulate second stage diversion flows through the power tunnel. Approximately two months are required for the water passage modification. This modification includes removal of the turbine and generator unit, removal of the penstock section at the powerhouse, removal of the butterfly valve, demolition and removal of concrete in the turbine scroll case alignment, and installation of a 11 foot steel pipe extension and an 11 foot diameter fixed-cone valve.

During second stage diversion, Lake Mills would be lowered about 60 feet to El. 515. Demolition and removal of the concrete arch dam to El. 515 would proceed over the extended duration of the reservoir dredging of the upper delta, which is assumed to take three months. Because demolition and removal of the concrete arch structure would be performed from a barge, the dam would be lowered in stages and would progress as dictated by the reservoir dredging program.

After the reservoir has been lowered to below El. 515, third stage diversion through notches would bypass reservoir inflows. Each successive notch would permit lowering the reservoir an additional 12.5 feet. However, the installation of each notch would require an estimated three weeks. With nine successive notches, the reservoir could be lowered from El. 515 to El. 400 in about six months, and the dam would be removed down to El. 405 with the last notch.

Although final demolition of dam concrete near the reservoir bottom should take only two to three weeks, it can be safely performed only under low river discharge conditions. Therefore, unless the work can be scheduled during the summer months when flows are typically low, completion of the Glines Canyon Dam removal could need to be temporarily suspended until favorable stream conditions occur.

2. SCHEDULE FOR ELWHA DAM REMOVAL: The estimated total time required for Elwha Dam removal, from contract award to completion of site restoration, is about 16 months, as shown in Figure F-25. The demolition of this dam and its related structures requires two diversion stages before the site can be restored to preproject conditions. Stage 1 diverts the reservoir inflows through the existing powerplants and south spillway. Stage 2 diverts reservoir inflows through a channel to be excavated in the north bank, discharging through the north spillway area (following spillway structure removal).

Water level would be controlled primarily by a passive rockfill overflow structure. Consequently, demolition would commence without delay due to lead times for fabrication and delivery of gates or valves. Following mobilization, second stage diversion facilities would be under construction for an estimated 3.5 month period. Meanwhile, first stage diversion through the powerplants and the south spillway would lower the reservoir 15 feet to about El. 180. During this period, a reservoir cofferdam would be constructed, the north spillway would be dismantled and removed, and the channel on both the dry and wet sides of the cofferdam would be excavated.

Following diversion into the newly excavated north bank channel, an access haul road could be constructed from the south abutment area. This road would permit removal of several Project appurtenances including the penstock, intake monolith, and powerhouses. Demolition and removal of these structures would take about four months. After the reservoir has been lowered to about El. 135, a sheet pile cofferdam cutoff could be installed to sufficiently reduce seepage under the main monolithic dam structure. Demolition and removal of about 20,000 cubic yards of mass concrete and 80,000 cubic yards of embankment material could be performed under dry conditions. At El. 135, the reservoir dredging operation of the Lake Aldwell delta would be mostly complete. However, the river could not yet be returned to its original channel. The schedule calls for demolition and removal of the main dam concrete monolith and embankment fill to continue for six months, plus an additional month for river channel restoration. Finally, one additional month would be needed to backfill the diversion channel, complete restoration of the site, and demobilize equipment from the site.

D. COST COMPARISON OF ALTERNATIVE DIVERSION PLANS

Cost estimates have been prepared on the basis of complete removal of the Glines Canyon and Elwha dams and related appurtenances as described in this report. Quantities were estimated and unit prices developed based on 1992 hourly labor rates, material and equipment costs, and estimated production rates. Allowances have been added for minimal unexpected work stoppages and for contractor's overhead and profit. Quotations to furnish river diversion gates and associated equipment were obtained from gate suppliers.

The direct cost (DC) includes the total of all of the contractor's costs directly chargeable to the project. These costs do not include owner's costs, such as engineering, administration, and financing. The base DC represents a contractor's bid offered in 1992. The bid prices have built-in escalation through the project period. Sales tax has not been included in the DC because the work is assumed to be federally funded and, therefore, not subject to state sales tax.

The total cost (TC) consists of the sum of the DC plus allowances for contingencies, engineering, and administration. To allow for unforeseen difficulties during the project and items not reflected in the estimate, an allowance of 20% for contingencies was applied to the DC. Allowances for engineering and administration costs are based on actual experience for dam and hydroelectric construction work. This item does not include costs of engineering work expended to date. However, it is intended to include costs of subsequent field investigations, processing of required permits, final design and preparation of contract documents, and management. An allowance of 18% of the DC, plus contingencies, is considered a reasonable estimate for engineering and administration.

All cost estimates are based on the 1992 bid price level. Although cost comparison of dam removal alternatives is an important consideration in selecting the preferred alternative, other qualitative features relating to performance and flexibility must also be considered. These include:

- ability to regulate outlet flow if reservoir level control reservoir is required;
- ability to control turbidity at the outlet; and
- adequacy of diversion capacity during the flood season.

Diversion features as described in this report serve two purposes. They facilitate dam demolition and removal work. They also permit effective dredging and other mechanical methods for removal of reservoir sediments to be performed through controlling the pool levels of the reservoirs.

Comparisons of estimated costs are presented below for the three Glines Canyon diversion plans and for the two plans developed for Elwha Dam. Cost estimates are based on 1992 prices.

	Cost* Glines Canyon $million	Cost* Elwha $million
Plan 1 Diversion Tunnel	12.37	14.53
Plan 2 Surface Diversion Channel	----	8.59
Plan 3 Low-Level Diversion	8.44	----
Plan 4 Notch Through Dam	9.12	----

*Estimated cost in 1992 dollars

E. CONSTRUCTABILITY AND RESERVOIR REGULATION DURING DAM REMOVAL

1. **GLINES CANYON DAM:** Both the low level outlet and notched diversion plans provide significant cost reductions over the diversion tunnel plan. However, final selection of a demolition plan requires further study of diversion phase scheduling for each alternative. If a diversion capacity of 5,000 cfs were needed for any stage, then the low level outlet approach would be the most cost effective. But if the required diversion capacity should decrease for certain phases, then the stepped notch approach becomes the most cost effective design.

For example, if stage 1 diversion can be limited to 2,700 cfs capacity through the power tunnel, then only the turbine runner need be pulled and the scroll case discharge diameter enlarged. The 11 foot diameter fixed-cone valve would become unnecessary, and a savings of $1.5 million in total costs would result. If, on the other hand, 5,000 cfs is desirable for the first stage but the discharge capacity through the stepped notches can be reduced, comparable savings of approximately $1.5 million or higher are possible. The degree of savings would depend upon whether a non-gated stepped notch is feasible during the low flow season of July to September and on what the design flood should be during this low flow period. Further hydrologic analysis of peak flood discharge for 5 and 10 year monthly floods would need to be estimated for each month during the year.

2. **ELWHA DAM:** The diversion channel plan provides an approximate reduction of $5.94 million in total cost compared to the diversion tunnel plan. On a cost basis, the diversion channel plan is preferable.

3. **DIVERSION AND POOL LEVEL REGULATION:** The dredging approach to remove reservoir sediments might be enhanced if the river's erosive forces are controlled where they enter the reservoirs. Therefore, outlet control for the plans presented includes the

capability for both lowering and raising the pool level. The diversion tunnels would provide the greatest capability to control the reservoir pool elevations. With the diversion tunnels in place, reservoir levels could be fully regulated, from the tunnel's control sill to the maximum pool level. Specific aspects of diversion and pool level regulation are discussed below for each of the dams.

a. **Glines Canyon Dam**. Two alternatives for river diversion at Glines Canyon Dam have been considered in addition to a new diversion tunnel. However, both use the existing power tunnel and would provide essentially the same outlet flow capability as the diversion tunnel, down to reservoir El. 515 msl. Lake Mills delta sediments are located primarily in the upper 70 feet of the reservoir.

Below El. 515 msl and down to original streambed elevation, the diversion tunnel provides superior outlet flow regulation. The low level outlet plan, which provides construction of an enlarged outlet conduit near the base of the arch dam for flow regulation, would perform adequately down to about El. 440 msl. Below El. 440, flow regulation would be performed by means of notches cut into the dam and would be less precise than through the conduit.

The "notch" diversion scheme creates a series of notches in the dam below El. 515. These notches would have some flow regulating capability, but could not regulate floods greater than about 3,000 cfs.

b. **Elwha Dam**. The diversion channel alternative for Elwha Dam removal does not provide headgates to regulate flows. However, the incremental removal of the cofferdam at the diversion channel inlet would provide for the gradual lowering of Lake Aldwell. To obtain regulating capability comparable to that of the diversion tunnel, the channel would have to be equipped with a headgate structure. Construction of a temporary headgate structure would add significantly to the cost of dam removal.

IV. SEDIMENT MANAGEMENT ALTERNATIVES

This section discusses a range of methods for reconstructing the river channel through the sediment material that is trapped in each reservoir. Nine "Scenarios" are developed with a brief description of each. Possible advantages and disadvantages are listed.

For nearly 80 years, the Elwha River dams have acted as large settling basins, slowing the river flow velocities and trapping material transported by the river behind the dams. Most of this material has been trapped in the upstream reservoir, Lake Mills. It is estimated that approximately 11.3 million cubic yards are trapped within Lake Mills while estimates for Lake Aldwell vary from 2.6 to over 4 million cubic yards.

Trapped material can be roughly divided into two categories. Coarse material, ranging in size from small sand to large gravel, has been deposited at the confluence of the reservoirs and the river, to form the deltas. Coarse material comprises most of the sediment trapped within Lake Mills (about 8 million cubic yards) and forms a delta about 70 feet deep. Fine material, smaller clay and silt sized particles, are evenly deposited throughout the beds of each reservoir.

Approaches for reconstructing the river channel were grouped into three general *Sediment Management* categories discussed in general below.

- The "*Removal*" alternative would remove and relocate all trapped material from the inundated regions to a new location outside of the reservoir area. The material could be relocated to an upland site or be deposited in saltwater. Excavation of trapped material would be conducted using mechanical equipment or hydraulic dredges.

- The "*Erosion*" alternative would allow river flow to erode or cut a new channel through the trapped material. Erosion would occur as a result of lowering the water elevations in the reservoirs. Eroded material would be washed downriver. Fine material would be suspended in the water column and transported to the Strait of Juan de Fuca. Coarse material would be eroded and supplemented with mechanical excavation as necessary.

- Trapped material has been deposited over the width of the reservoirs. The "*Retention*" alternative would remove only material in the path of the river and relocate it adjacent to the new channel. In this approach, much of the trapped material would remain in place undisturbed. Material removed from the path of the river would be stabilized adjacent to the river channel. Removing and relocating material could be accomplished either by using mechanical equipment including hydraulic dredges or by allowing river flow to erode material and relocate it.

Sediment Material Characteristics

Based on particle size, material is conventionally divided into gravel, sand, silt and clay sized particles. Sediment generally decreases in size with distance from the confluence of the lake and the river. Approximately 86% of 7.3 million cubic yards in the Lake Mills delta meets the sand or gravel grain size criterion. Nearly all of the material downstream of the delta, in the lake bed areas, is small enough to fit into the silt or clay sized particle classification.

Mechanical properties of sand and gravel (coarse material) and silt and clay sized particles (fine material) are different and would be transported, compacted, excavated and stabilized in different manners. Coarse material roughly corresponds to bed load, material transported by rolling along the riverbed (particles > 1 mm). Fine material roughly corresponds to suspended sediment (particles <.1 mm), material transported in the water column.

Coarse material can be eroded and transported by the river only relatively slowly. For this reason the *Erosion* approaches would take many years to complete if only river flow were used to remove coarse trapped material. The relative stability of coarse material would allow construction of steep slopes when deposited. Coarse material is used to stabilize and contain the fine material in the *Retention* approaches.

Fine material will tend to flow when deposited and will not be stable at steep slopes. However, this material will easily erode and will stay in suspension when introduced into the water column. The *Erosion* approaches consider the possibility of eroding and placing this material into the river where it would be washed into saltwater.

Material	Size Range	Best Method of Handling	Location	Erodibility	Stable Angle of Repose
Coarse Material	Boulders to .06 mm	Hydraulic Dredge or Mechanical Equipment	Delta Region at beginning of Reservoirs	Erodes slowly - Transported along riverbed	3 horizontal to 1 vertical
Fine Material	.06 mm to .0024 mm	Hydraulic Dredge	Spread throughout Lake bed	Erodes quickly - Transported in water Column	10 horizontal to 1 vertical

Each reservoir contains both fine and coarse material. For convenience, each scenario is shown in Figure F-26 where the ultimate destination of coarse or fine material is indicated by a black square.

Sediment Management Design Criteria

The criteria of the *Sediment Management* and *Dam Removal* effort are (1) achieve full ecosystem and native anadromous fisheries restoration, (2) minimize detrimental environmental impacts, and

(3) keep project costs reasonable. Some of the issues considered are discussed below.

Revegetation Potential of Relocated Sediments

For the *Retention* approaches, delta sediments capable of supporting vegetation would be placed on the surface of all relocated material. This material would be placed over silt sized material relocated along the river to enhance revegetation. For the *Erosion* and *Removal* approaches it was assumed that the trapped material would be removed entirely and preexisting material would support vegetation.

Water Quality During Sediment Relocation

Water quality criteria would depend on the actions taken to protect water supplies and fisheries that depend on the Elwha River. The *Retention* approaches were developed to provide the highest level of water quality protection for domestic, municipal, industrial and fisheries water users. Using this approach, river turbidity levels would remain low during construction and use of water downriver would be possible during construction. The *Removal* approach would probably experience only slightly higher levels of turbidity during removal than the *Retention* approach. The *Erosion* approaches would increase turbidity and potentially require temporary relocation of fish production. Measures to protect industrial, domestic and private water users during the removal process would also be necessary.

Channel Configuration

For the *Retention* approach, contours were developed to meet stability requirements for static conditions with a factor of safety of approximately 1.3 (resistance to movement of relocated material is 30% greater than potential for movement). Contours were also developed with the objective of providing the widest possible flood plain for a given volume of relocated material.

A. EFFECTS OF DAM REMOVAL AND SEDIMENT MANAGEMENT

Each approach would have impacts on the environment, would result in different profiles and final configuration of land now part of the lakes, and would require different schedules and incur different costs. The three approaches were briefly described above in a generic manner in order to evaluate and help conceptualize the range of options. However, many combinations of elements of the three approaches could also be incorporated into a single approach. For instance, washing the silt and clay material into saltwater while retaining granular material combines features of the *Erosion* and *Retention* approaches. A discussion of issues investigated and compared for the various Scenarios is presented below.

1. **COST:** Cost comparisons were based on the cost to remove the dams and restore the river channel. These comparisons do not include costs associated with other measures required for water supplies necessary to implement a particular approach. For instance, the *Erosion* approach might require significantly more cost for water supply and downstream protection than other approaches that release little or no sediment from the sediment management process. Cost estimates for water quality protection are provided in Section VI(E).

2. **IMPACTS ON RELOCATION SITE:** Impacts on relocation site landscape and environment would occur when materials are taken from the lake regions and redeposited at another location. This is because of the large volume of material trapped in the lakes rather than the nature of the material. The issues considered were environmental impact and usage. For instance, the *Erosion* approach would potentially have significant temporary impacts on river and marine life by burying shellfish with eroded sediments, killing invertebrates in the river, and raising riverbed elevations. However, some positive effects might also be anticipated from this approach, such as increased quantities of spawning gravel along reaches of the river which have been depleted by dam construction.

The *Removal* approach would necessarily have an impact on the relocation site. Impacts would be difficult to determine without further study. The conclusions of a study conducted by the dam license applicant implied that these effects would be negative.

Impacts on the relocation site for the *Retention* approach would vary depending on amounts of material relocated. In any event the site has been impacted by the construction of the dams and any local relocation would change these impacts only slightly.

3. **WATER QUALITY:** Water quality addresses effects of sediment management activities during and after dam removal on fish and domestic and industrial water users. Impacts would depend on the extent and types of actions taken prior to removal activities. For instance, if measures were taken to protect water supplies and fish rearing facilities could be protected or relocated, the *Erosion* approach could be preferable. HEC-6 analysis shows suspended sediment concentrations would be initially very high for this approach (over 1,000 ppm) and remain over 500 ppm for nearly 3 years. Normal background suspended sediment levels (above the dams) are estimated to be approximately 60 mg/l during average daily flows. The *Erosion* approach would temporarily violate standards for allowable turbidity and suspended sediment levels during dam removal.

a. Monitoring Parameters Literature Review. As part of the *Retention* approach, an investigation of allowable turbidity and suspended sediment concentrations was conducted. The following literature was reviewed to help establish monitoring parameters:

Environmental Protection Agency (EPA). 1991. Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska. p. 39-83.

Idaho Dept of Health and Welfare, Water Quality Bureau, "Technical Review of Sediment Criteria," pages 4-12.

Lloyd, D. S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. N. Amer. J. Fish. Manage. 34-41.

Bell, M. C. 1984. Fisheries Handbook of Engineering Requirements and Biological Criteria. p. 103-117. U.S. Army Corps of Engineers.

The criteria discussed in the EPA publication for the selection of monitoring parameters is either adopted in the other publications or supported by information contained in those reports. Therefore, most of the guidelines are largely from the EPA report.

The selection of monitoring guideline parameters is dependent on the sensitivity of those parameters to the water uses. For this restoration project, the quality of the domestic water supply should be considered. Industrial water supplies would also be affected, although criteria are not discussed in the EPA report. It was assumed that the survival of anadromous fish would need to be maintained, although a number of options (e.g., timing of removal, captive brood collection, maintenance of hatchery stocks) are available to do so. However, additional risks are incurred with increased reliance on hatchery propagation for this purpose. Further engineering analysis is necessary to identify opportunities for limiting sediment releases to minimize impacts on lower river fish stocks.

Water usage is affected mainly by water temperature, intergravel dissolved oxygen (DO), the presence of suspended sediment, turbidity, bacteria, and invertebrates. The EPA suggests that these parameters are most sensitive to road building and placer mining activities, which are similar to those which would occur during the lake restoration process. In addition, these parameters are highly interrelated, hence measuring these parameters would be extremely useful in a monitoring program for this project.

b. **Temperature**. Temperature of the water affects the function of several processes in the river. While the rate of water flow is the most significant contributor to fluctuations in temperature, turbidity and bed load also affect water temperature. The general EPA standard states:

> ...the weekly average warm season temperature should (1) meet site-specific requirements for successful migration, spawning, egg incubation, fry rearing, and other reproductive functions of important species; (2) preserve normal species diversity or prevent appearance of nuisance organisms; and (3) not exceed a value more than one-third of the difference between the optimum and the lethal temperature for sensitive species (EPA 1986b).

c. **Intergravel Dissolved Oxygen (DO).** Intergravel DO is essential to the biological processes of stream organisms. The introduction of large quantities of fine and coarse sediment (bed load) affect the balance of DO in the stream bed. Reduction of instream DO levels to 4-5 mg/l begins to significantly affect salmonid and invertebrate production. Intergravel DO is assumed to be approximately 3 mg/L less than the instream DO concentrations. Idaho standards state:

> Nonpoint source activities shall not cause intergravel dissolved oxygen in spawning gravels to decline, below a weekly average of 90% of saturation or 6 mg/L, whichever is greater."

d. **Suspended Sediment.** Suspended sediment is defined by the EPA as particles less than 0.1 mm diameter such as clay, silt, and very fine sand. Silt and clay (<.062 mm) were used to predict suspended sediment concentrations for analysis in this report. These particles are introduced during runoff events and essentially never settle out of the water column. Bed load is considered to be particles greater than 0.1 mm.

Fine suspended particles tend to fill the spaces between course particles within the stream bed, this reduces habitat space for small fish and invertebrates. It also reduces permeability which results in declined intergravel DO concentrations.

The previously mentioned literature suggests that suspended sediment concentrations (SSC) of about 300-500 mg/L reduce the ability of juvenile salmonids to capture prey, thereby increasing stress on the fish and reducing their growth and survival. Adult salmon avoid migration through streams with these levels of SSC. Fatality occurs for juveniles at 1200 mg/L and 20,000 mg/L for adult salmonids. The EPA standard for measuring SSC is:

> Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonally established norm for aquatic life.

The primary problem with measuring SSC is variability. The EPA suggests that there is 25% to 50% uncertainty in these measurements. However, SSC is often measured in turbidity units. Turbidity measurements have successfully predicted 80% of the variation in suspended sediment concentrations. Thus, turbidity is often used as a surrogate for SSC. The Lloyd paper presents ranges for protecting fish in Alaskan rivers:

Moderate protection	26-80 mg/L = 20 NTU
High protection	0-25 mg/L = 7 NTU

e. Turbidity. Turbidity is probably the most effective method of monitoring water quality for this project as it is fairly accurate (uncertainty of 10%) and generally accepted. Studies have shown that salmonid feeding is impaired at turbidities in the range of 25-70 NTU. Tissue damage occurs after 5-10 days of exposure at 25 NTU and growth is reduced. The general EPA criteria for turbidity is similar to that for SSC:

> ...the depth of photosynthetic compensation point should not be reduced by more than 10% from the seasonally established norm for aquatic life.

Table F-3: Turbidity Standards

State	**Turbidity**
Washington	+5 NTU when background < 50 NTU +10% when background > 50 NTU
Alaska	+25 in streams +5 in lakes
California	+20% above natural not to exceed 10 NTU above
Idaho	+5 when background < 50 NTU +10% not to exceed +25 when background > 50 NTU
Oregon	+10%

Retention and *Removal* approaches would have lesser impacts on water quality since material disturbed during sediment relocation and construction would be partially trapped by the lakes. The dams would remain in place to help trap sediment and reduce turbidity during the sediment relocation process. *Removal* was judged to have a greater potential for oil spills and water contamination impacts due to the larger numbers of heavy equipment involved.

4. CONSTRUCTION TIME: Construction time required to implement a particular sediment management scenario would vary. Economic and environmental effects of a proposed project would be related to the length of time required. Extended time could increase inspection costs, engineering, construction and support staffs. Adverse environmental effects such as poor air quality, noise, and increased turbidity might also be extended with increased time. In general, longer periods were considered to affect the project more negatively than shorter periods.

The *Retention* approach, which relocates the smallest volumes of material, would require the least time of the approaches. The *Erosion* approach, which is limited by the transport capacity of the river, would require the greatest amount of time. The *Removal* approach would require more time using the same amount of construction equipment and personnel than the *Retention* approach primarily because it would move greater volumes of material larger distances.

Table F-4. Estimated Project Time.

Approach	Approximate Construction Time Required
Erosion	10 to > 20 years
Retention	3 to 5 years
Removal	5 to 9 years

5. **RELIABILITY:** The ability to predict the nature and cost of construction will vary. Both the *Retention* and *Removal* approaches are employee standard construction activities and can be reliably planned and designed. Similar activities conducted on other projects were used to develop costs, construction schedules, and environmental impacts. Due to the unpredictability of river flows and transport capacity prediction, and lack of previous construction activities, estimations of schedules, costs, and impacts of the *Erosion* approach are less reliable.

6. **AIR QUALITY:** The activities associated with the *Removal* process would reduce air quality if large numbers (estimates vary between 65 and 150) of earthmoving equipment were used. Effects of reduced air quality, impacts on wildlife, Olympic National Park use, and commercial activities are unknown, but would potentially be negative. Compared to the *Removal* approach, the *Erosion* and *Retention* approaches would have relatively minor impacts on the quality of the air in the vicinity of construction activities. The effects of the *Retention* approach would vary depending on construction method and equipment used. A shorter construction period would require more heavy equipment (estimated at 68 pieces if mechanical equipment is used to excavate and relocate material).

The lowest cost and lowest impact *Retention* option would use relatively few pieces of heavy equipment and produce relatively little air pollution. The *Removal* approach would require a significantly larger amount of personnel and heavy machinery (estimated at over 150 pieces) and would disturb the environment near the site more than the other approaches.

7. **FINAL LAKE SITE CONFIGURATION:** Consideration was given to the configuration of the lake areas where new landscaping and river restoration activities would occur. The most desirable

configuration was considered to be total removal of all trapped material. Based on this objective both the *Erosion* and the *Removal* approaches have the potential to create contours similar to predam conditions. By its nature, the *Retention* approach would create contours substantially different from those of the predam landscape.

B. DETAILED DISCUSSION OF SEDIMENT MANAGEMENT ALTERNATIVES

Approaches to *Sediment Management* have been grouped into three generalized categories and combinations of these. From the generalized approaches, nine detailed scenarios were developed to a level that would allow the determination of feasibility and relative cost. Figure F-26 provides a synopsis of each Scenario and shows the current and proposed final location of trapped material. Because the methods of transporting, stabilizing and handling are distinctly different, proposed final locations of coarse and fine trapped material are shown separately. For instance, in *Removal* Scenario 2, fine material from Lake Mills would be relocated to saltwater in the Strait of Juan de Fuca, indicated by the black square beneath the saltwater heading under Lake Mills across from Scenario 2 in the Figure F-26.

1. **REMOVAL:** As previously discussed, the *Removal* scenarios (Scenarios 1 and 2) would completely remove all trapped materials accumulated in the lakes since dam construction. A cursory investigation of these scenarios was conducted by the dam owners during the FERC relicensing process. A synopsis of that information is presented here as Scenarios 1 and 2.

SCENARIO 1 - Complete Removal, Dry Excavation

Lake Mills
Coarse material excavated to upland site
Fine material excavated to upland site

Lake Aldwell
Coarse material excavated to upland site
Fine material excavated to upland site

In this approach, structures are demolished and river sediments are dredged or mechanically excavated and transported to a distant disposal site, either terrestrial or saltwater. Approaches using both mechanical and dredging equipment were investigated. Of the three general approaches, *Removal* would be the most expensive, time consuming, and disruptive to the immediate environment.

As part of the dam owner's investigation, material sampling was conducted in the lake beds and delta regions to determine material grain size distribution and location. The sampling was used to develop lake bed contours and to analyze construction schedules, cost and techniques for relocating the material.

Sediments could be transported to an upland disposal site or open water disposal site via specially constructed haul routes. Prior to the mobilization of excavation equipment, the two reservoirs would be drained and the sediments trapped behind the dams allowed to stabilize. Hydraulic controls in the Elwha and Glines Canyon dams would allow the release of water in a controlled manner. Substantial erosion and deposition of sediments would occur.

As part of the review of this process, a computer model (HEC-6) was used to predict the behavior of the sediment during the reservoir lowering process. The model indicates that a substantial amount of sediment management, water surface control and water quality monitoring would be necessary during the lake lowering/draining process in addition to the efforts described in the applicant's approach. A rapid drawdown process could introduce large quantities of material into suspension. Some of this material would pass by the dams and increase suspended sediment levels downstream. No water quality standards have been explicitly determined for the process of dam removal and sediment stabilization (except as discussed in the previous section).

However, for a similar project conducted by British Columbia Hydropower involving similar downstream water users, standards were set to protect fish and water supplies. The project involved dredging and redepositing material underwater in a reservoir. Regulations were similar to those cited in the EPA monitoring criteria. Construction activities were allowed to increase suspended sediment levels in the river by 25 mg/l above the background level (the concentration of suspended sediments in the river without construction activities).

Once the lakes have been drained and the sediment left behind the dams has been stabilized, erosion control measures would be implemented. These measures include watering active construction sites to control dust, channel location stabilization during excavation procedures and seeding completed sites. Sediment would be transported to the disposal sites using (15)-70 ton haul vehicles operating 120 hours/week for approximately 5 years, in addition to loading and grading vehicles at the site.

To accommodate the large haul vehicles, haul roads allowing two way vehicle traffic would need to be constructed from the lake areas to the disposal sites. If the material were to be transported to the upland disposal site, approximately 10 miles of haul road would be required for Lake Mills and Lake Aldwell combined. Some haul vehicle traffic could parallel or use existing highways and county roads. If the open water disposal site option were chosen, the length of haul road would be substantially longer.

The upland disposal site discussed by the applicant is located at the base of Kelly Mountain, west of the upstream end of Lake Aldwell and north of U.S. Highway 101. The land is undeveloped, easily accessible by haul road, and relatively flat. It is owned by the Washington State Department of Natural Resources and private landowners, and is currently being used for timber production. The advantage of this site is its proximity to both projects, which promotes lower transportation costs. Upland disposal could also have less adverse environmental impacts than open water disposal, but would still significantly impact air quality and land at the disposal site.

Once the removal of the trapped sediments at the reservoir sites has been completed, the entire area would be planted with native vegetation. Additional slope stabilization could be required in specific locations. All haul roads would be reshaped to their natural contours and replanted.

SCENARIO 2 - Complete Removal, Wet Excavation

Lake Mills
Coarse material excavated and transported to saltwater
Fine material excavated and transported to saltwater

Lake Aldwell
Coarse material excavated and transported to saltwater
Fine material excavated and transported to saltwater

An alternative approach using hydraulic dredges to remove sediment while the dams and reservoirs are still in place was investigated by the applicant. This approach would use a pipe to transport a slurry of solids and water into a barge located near the mouth of the river. The barge would haul the material to a designated open water disposal.

Large segmental hydraulic cutterhead suction dredges would be transported to the site and reassembled. A staging area and movable docking facilities would be constructed on the reservoir banks to launch the dredge and other necessary equipment. The dredge, which is operated from a barge, would be submerged on a ladder arm and powered by a diesel engine or electric generator. The revolving cutterhead would excavate and transport material into a pipe located in the center of the revolving head. These large dredges are capable of cutting and removing most material including woody debris. A clamshell dredge might be required to remove larger gravel, boulders, and stumps.

The slurry of solid material and water would be pumped into a receiving barge on the lake surface or directly into the transport pipeline. A pipeline with intermittent booster pumps would transport the slurry to a transport barge located near the mouth of the river.

A designated dispersive disposal site for dredged material is located in the Strait of Juan de Fuca, approximately 4 miles north of Port Angeles. A 1989 Corps of Engineers study suggests that it may not have the capacity for the total volume of sediment removed from the sites. A portion of the material could need to be deposited in the ocean, possibly near Cape Flattery. A barge facility would need to be constructed in Port Angeles Harbor. A route for haul vehicles or sediment pipeline would be required through town to transport material to the barge facility. This operation would be extremely difficult and would significantly impact the City of Port Angeles.

Alternately, the material could be transported by road to the disposal site. The slurry could be pumped into a transport barge, hauled to the lakeshore, and transported to either the upland or saltwater disposal site. However, the dredged slurry mix is approximately 25% solids to 75% water. This would increase the barge size, traffic and transportation costs significantly. Another option would be to pump the material directly to a disposal site. A floating pipeline would be used from the dredge to the lakeshore. A land based pipeline would continue from there to either the upland disposal site or the open water site.

The sediment slurry could be pumped to an upland disposal site. But because of the large volume of water in the slurry, an embankment would need to be constructed in order to contain the slurry at the site. Another option would be to pump the slurry to the barge facility near Freshwater Bay. The pipeline would run roughly parallel with the Elwha River and be floated on Lake Aldwell. From Elwha Dam, the pipeline would continue through Port Angeles to the Freshwater Bay barge facility. More than 20 miles of pipeline along with booster pumps every 1 to 2 miles would be necessary for this option.

Schedule. Estimates of construction time for activities required to remove dam structures and sediment for complete sediment removal as presented in the dam owner's approach range from 5 to 9 years (Table F-5).

Table F-5. Schedule for complete removal of trapped material.

Activity	dry+saltwater	dry+upland	wet+saltwater
Permits	3 yrs	3 years	3 years
Engineering	3 yrs	3 years	3 years
Construction	5 yrs	5 years	9 years

A brief comparison of the advantages and disadvantages of Scenarios 1 and 2 is presented below.

Advantages

- The *Removal* approach uses techniques that have been used in the past on other similar projects. These construction techniques are relatively predictable and controllable.
- The final configuration in Olympic National Park after removal would closely approximate predam conditions. Spawning habitat in the lake regions could be restored. Most of the material would be removed from the affected areas.

Disadvantages

- The *Removal* approach is the most costly of all approaches considered. Higher cost results because this approach requires greater quantities of material to be relocated.
- Environmental effects of this approach would be comparatively greater for air and noise quality at the construction site due to the large number of vehicles required to transport the material to a new location. Impacts on the land at the disposal site would also be the greatest of all approaches considered.
- Water users would need to be adequately protected during lake level drawdown. Drawdown and construction could cause large quantities of suspended sediment to be washed downriver. Both hydraulic dredging and mechanical excavation approaches would adversely affect fish and wildlife for some period of time.
- The dam owner's construction schedule predicted a long completion time, up to 9 years. However, with more equipment and manpower, this schedule could be reduced.

2. **EROSION**: The *Erosion* approach investigates the ability of the natural transport capacity of the river to remove and/or relocate sediments. Numerous variations on this approach are possible and were investigated. The major investigations include (1) complete erosion of all trapped material through the river system to saltwater using river flow, Scenario 3, (2) using the river to erode Lake Mills' delta to a 'stable' configuration, Scenarios 4, 6 and 7, and (3) washing only fine material through the river system, Scenarios 8 and 9. For clarity, a brief description is given at the beginning of each of Scenarios 3 through 7 showing the method and location of trapped coarse and fine material removed from the reservoirs.

SCENARIO 3 - Erode All Material

Lake Mills
Coarse material eroded to saltwater
Fine material eroded to saltwater

Lake Aldwell
Coarse material eroded to saltwater
Fine material eroded to saltwater

An investigation, using computer modelling (U.S. Army Corps of Engineers HEC-6 program, version 4.0) was conducted to determine the ability of the river system to transport all trapped material out of the reservoir areas. Sediment data used for the modelling were those presented in the dam owner's report (Hosey 1990). Sediment rating curves used were a modified version of that used in the initial FERC draft Environmental Impact Statement (EIS).

These computer simulations indicate that fine material could be removed and transported as quickly as the material could be introduced into the river flow. This could be accomplished most efficiently by using submersible dredges to pump fine material into the river. Depending on the type and number of dredges and the constraints imposed on turbidity, fine material could be removed and suspended in approximately 1 to 3 years.

A cursory analysis would imply that allowing the river to transport the sediment might require the least equipment and manpower effort, and potentially be the least expensive method of sediment removal. Analysis showed, however, that this method produced significant potential impacts on the river system, the marine environment and would not necessarily be economical. Further investigation of these potential impacts and possible mitigation measures is needed.

Some form of intervention with mechanical equipment and/or dredging equipment would be required to force lakebed sediments into suspension. The use of mechanical equipment and or dredges would reduce the potential economic benefits. Delta material could be eroded by directing the flow of the river using movable concrete barriers. Directing flow through adjacent alignments along the surface of the delta might potentially remove most of the sediment in the delta to a downstream location. A limited amount of equipment would be required to move barriers, large sized material and to help control the erosion process. A clamshell dredge would probably be required to continuously remove larger material, which if left in place would reduce the erosion process.

Analysis showed that approximately 20 years would be required to transport most of the trapped sediments through and out of the river and to stabilize the courser sands and gravels redeposited in the riverbed. Initially, the process would create large suspended sediment concentrations in the river system for approximately 12 to 24 months as the fine lakebed material washed out. Dredging fine material would be required since the course of the river could not be relied upon to flow through all locations where sediments have been deposited in the lakes. Average concentrations of 1500 ppm could be expected with peaks of 3000 ppm during high flows. These high levels of suspended sediment could potentially have adverse impacts on domestic and industrial water supplies taken from the river and could negatively affect migrating fish and fish rearing facilities. Larger material, transported as bed load, would move much slower and could raise riverbed elevations causing local flooding and changes in river channel location.

During the initial lake drawdown, the river would rapidly move the granular delta material. Analysis showed that as the erosion process progresses, the bed would begin to armor and the rate of erosion would decline. Smaller particles would continue to be eroded, while larger material would remain in the riverbed. This "armoring" process would cause the riverbed to stabilize at a slope of approximately 0.6% after approximately 30 months, moving approximately 46% of the delta material in the path of the river flow.

Two options were investigated to remedy the "armoring" of the riverbed which reduced the rate of material transported. The first option would allow the river to continue to operate and naturally, but slowly, erode the delta. The second option would mechanically or hydraulically remove armoring material. Both approaches would require construction personnel to be available to remove or manage large quantities during the process. For instance, a large flow could cause unstable deposits of material to accumulate along the river. A large flood could relocate material to undesirable locations and cause localized flooding.

Removing the finer material would require either hydraulically dredging material into the river or redirecting the river into lakebed areas not in the natural river path. Both methods require extensive construction equipment and incur cost similar to the "cleaner" less impactive *Retention* approach.

Because the HEC-6 analysis indicated long periods of time would be required to transport all the accumulated sediment in the lakes (greater than 20 years if all material were removed from Lake Mills), a detailed cost estimate using only river flow to transport material was not developed. However, it is anticipated that cost would be high due to requirement of continued presence of construction personnel and equipment.

For comparison purposes, a cost estimate was developed assuming that 75% of material in the deltas would require mechanical or hydraulic assistance to initiate the erosion process. Since the river would cut a path through the lowest elevation in the lake areas, it was assumed that only 1/2 of all the fine sediments would be introduced into the river flow without hydraulically dredging the material. Additional assistance was estimated to be required to complete the process of transporting the delta material after initial erosion and dredging. Approximately 25% of the delta material would be redredged up to two times. This estimate also includes a contingency of 50% indicating the high degree of uncertainty associated with this approach.

Advantages

- Long-term, the potential for returning the river to a stable condition similar to that prior to dam construction is possible. Riverbed material would be replenished, which would be beneficial for fish spawning.

- Less mechanical equipment would be required compared to the *Removal* scenarios resulting in lower impacts on air and noise quality.

Disadvantages

- This approach produces the highest levels of suspended sediments and bed load levels of all approaches investigated. It would greatly increase suspended sediment levels over natural (background) levels during the fine material removal. Depending on the approach used, levels could be elevated for approximately 3 years.

- The ability to predict and control the effects of material moving through the river system is poor.

- Impacts to river morphology could cause localized flooding. Flood protection levees would need to be modified, improved and extended.

- Increased bed load and suspended sediment levels could impact fish habitat and health during the sediment removal period.

- Depending on solutions implemented for water user protection, this approach could impact or limit the ability to use river water for pulp mills. Domestic water supplies would need to be modified or relocated.

- An investigation of the impacts to living marine resources was not conducted. However, the possibility is high that some impacts would occur due to rapid introduction of larger than average amounts of sediment into the marine area.

- This approach would require the greatest amount of time for material removal. Increased levels of turbidity would be possible for over twenty years.

SCENARIO 4 - Partial Erosion, Temporarily Store Material in Lake Aldwell

Lake Mills

Limited amounts of coarse material eroded to Lake Aldwell
Fine material eroded to the Strait of Juan de Fuca

Lake Aldwell

Coarse material relocated in Lake Aldwell
Fine material eroded to the Strait of Juan de Fuca

Scenario 4 investigates using Lake Aldwell as a relocation site for Lake Mills delta material. Fine material in both lakes would be washed into saltwater. In this Scenario, the river would erode and carry the fine material downstream where approximately 1/3 of this material would be trapped in Lake Aldwell. Due to the length of time and the difficulty projected with using river flow to transport coarse material, this investigation transported coarse sediment from the delta using a pipeline to Lake Aldwell.

The amount of coarse material relocated into Lake Mills would be limited by the storage capability in Lake Aldwell. Insufficient storage is available for all of the coarse material trapped in Lakes Aldwell and Mills (see Figure F-27). Dredging the fine material in Lake Aldwell and the redeposited fine sediments from Lake Mills erosion would be necessary to allow room for coarse Lake Mills material storage.

The fine sediments trapped in Lake Mills would be removed first. Submersible pump dredges, operating by barge, would remove the sediment from the lakebed. The slurry would be pumped over the dam and into the river. The river's energy would be sufficient to transport the material as suspended sediment to Lake Aldwell without significant redeposition along the river. Approximately 1/3 of the fine sediment would be trapped Lake Aldwell. The rest would flow past the dam and eventually out of the river system.

The fine sediment trapped in Lake Aldwell would then be dredged into the river to provide additional storage volume for course materials from Lake Mills. Submersible pump dredges would remove the original lakebed sediment and redeposited fines from Lake Mills, pump them over Elwha Dam and into the river where they would travel down the river and out of the system. Suspended sediment concentrations would be increased during the dredging and erosion process. As discussed previously, an average of 1500 ppm could be expected when removing the fine sediments and introducing them into the river.

Calculations of available storage area in Lake Aldwell indicate that space is available for only about 42% of the Lake Mills delta material. Due to this limitation, relocating the entire volume of Lake Mills delta material (approximately 7.3 million cubic yards) in Lake Aldwell is not a viable option. Instead, a channel could be constructed through the Lake Mills delta material, removing only a portion of material, but creating a stable channel configuration. A 250 foot wide channel with a 0.6% slope would be stable, and would require a volume to be removed roughly equal to the volume of storage available in Lake Aldwell, approximately 3.34 million cubic yards including fine material which would be 'washed' out.

The process of erosion would be used to cut and stabilize a channel through the Lake Mills delta material. According to HEC-6 studies, suspended sediment concentrations would be elevated to an average of 800 ppm for nearly two years during the initial delta erosion procedure. The course material would settle out rapidly once it reached the lower reaches of Lake Mills. At that point, the course sediment would be dredged out of the lake and pumped downstream to Lake Aldwell through a land based pipeline located parallel to the river. The option of letting the sediment wash downstream was investigated, but was not considered a viable option considering the length of time required to transport the material downstream, suspended sediment levels, and the workforce required to maintain sections of river between the two dams to prevent unstable aggradation.

Before the course sediment pumped from Lake Mills could be redeposited in the Lake Aldwell region, a channel would be constructed in the upper reaches of Lake Aldwell to allow flood flows to pass. Approximately 890,000 cy of material would be relocated to create a 500′ channel through the Lake Aldwell coarse material. All dredged material from Lake Aldwell and material pumped from Lake Mills could then be stored on the banks of the channel in Lake Aldwell.

It should be noted that the testing required to determine the volume of material trapped in the upstream reaches of Lake Aldwell has not been conducted and the precise quantity of this material is unknown. The amount of material located in this area would affect the storage available for sediments transported from Lake Mills. If testing shows larger quantities of material are trapped in Lake Aldwell, this option may not be viable.

Use of a pipe to transport material would prevent aggradation of coarse sediments in river reaches. However, it would not decrease the levels of suspended sediment that could be experienced by downstream water users from those that would be expected in the *Erosion* approach.

No significant cost savings would be realized in this approach when compared to the *Retention* approach. Construction of a pipeline from Lake Mills to Lake Aldwell would be expensive to construct, and maintain, and could possibly have negative environmental impacts. In addition, very little area in the region of the lakes would be returned to a natural state.

Advantages

- Aggradation of course sediments in the river and the potential for flooding downstream of Elwha Dam would be avoided by trapping material in Lake Aldwell.
- The lakebed region of Lake Mills would be free of sediment and could potentially be used as spawning habitat.

Disadvantages

- Suspended sediment levels would be increased significantly over natural (background) levels. Depending on the sediment removal schedule, levels would be elevated for approximately 3 years.
- Depending on solutions implemented for water user protection, this approach could impact or limit the ability to use river water for pulp mills. Domestic water supplies would probably need to be modified or relocated.
- Increased suspended sediment levels could severely impact fish habitat and health during the removal period.
- Constructing and maintaining a pipeline from Lake Mills to Lake Aldwell could have negative environmental impacts along the river.
- Final configuration of the affected areas would be functional, but this approach would not restore them to pre-dam conditions.
- Reaching the stable configuration in Lake Mills would be difficult to predict and maintain.

3. **RETENTION:** The essential feature of the *Retention* option is that trapped material is relocated from the river channel to a new location in the lake areas. In other words, trapped material is retained in, instead of removed from, the lake areas. Cost savings would result when compared to other approaches because these approaches disturb and/or relocate smaller volumes of material and move it relatively short distances.

Numerous variations of this approach are possible. Scenarios 5 and 6 illustrate two of the least expensive approaches. Other approaches that were investigated (but are not presented here) used mechanical equipment to excavate material after lowering reservoir levels, the erosive power of the river to permanently relocate material, and combinations of hydraulic dredges, mechanical equipment, and erosion to relocate material.

Scenario 5 allows the greatest control over and lowest levels of suspended sediment in the lakes and downstream. Two sediment excavation and relocation methods were investigated in Scenario 5, using mechanical equipment and using hydraulic dredges. Both methods are discussed in the following.

Mechanical excavation methods would be more expensive and time consuming and would not provide any advantages compared to hydraulic dredging methods. Cost studies presented for Scenario 5 presume hydraulic dredging activities. Hydraulic dredging activities would be conducted with the reservoirs in place to act as settling basins and would provide cleaner downstream water during the construction process. Both Scenario 5 and 6 are among the least expensive and the least disruptive approaches to downriver water users.

Retention of material in the reservoir area would not completely restore the configuration of the river valley to its pre-dam condition. Material deposited in lakes in the pre-dam river channel would be removed to form a new smaller (than pre-dam) channel and relocated adjacent to the river.

In Lake Mills sufficient submerged land area exists adjacent to the river channel, in what was a broad flood plain before dam construction, to relocate material. Lake Aldwell has less land area available to relocate material, but has sufficient land area to accommodate the construction of a 500 foot wide river channel.

Scenario 5 would create a new channel through the delta material at the original riverbed elevation. Scenario 6, would allow the river to erode a channel to a stable bed elevation from the mouth of Rica Canyon to the end of the delta, and would leave more of the delta material in place (4.0 million cubic yards vs. 3.34 million cubic yards respectively) and require less material to be relocated. Scenario 6 would also increase downstream turbidity levels during the erosion process.

Investigation of the stability of coarse and fine material stored adjacent to the river banks indicated that with the construction of granular berms along the length of the river, a slope of 1 foot vertical to 4 feet horizontal would be stable under static conditions for heights up to 80 feet above the riverbed. Figures F-28 and F-29 show proposed final contours and channel widths for both Scenarios 5 and 6. Figures F-30 and F-31 show sections through the lakes after construction is complete.

Scour protection could be provided to ensure that future floods would not erode the relocated material into the river potentially causing downstream water quality and flooding problems. The nature and extent of scour protection would be determined by aesthetic requirements and downstream water user protection.

SCENARIO 5 - Use mechanical Equipment or Submersible Dredges to Relocate Coarse and Fine Material Adjacent to New Channel

Lake Mills
Coarse material relocated in reservoir
Fine material relocated in reservoir

Lake Aldwell
Coarse material relocated in reservoir
Fine material relocated in reservoir

Because the dams would remain in place to act as large settling basins, the Scenario 5 approach would potentially secure the highest water quality during construction and the least impact to fish and water users. Material disturbed during the dredging or excavating activities would have the opportunity to resettle in the lake bed regions. Impermeable silt curtains would be used to redirect and contain suspended material to enhance the settling process.

Because of limitations on available space in the reservoir area for material relocation, channel width was limited to approximately 500 feet. This width would allow flow to remain within the channel during a flood event that would recur approximately once every two years. For the average daily flow of approximately 1500 cfs, the width of the river would be approximately 200 feet. The pre-dam river channel width varies, but in the region now covered by lakes the pre-dam flood plain width was as much as 2000 feet.

Excavate with Mechanical Equipment. Two primary considerations were investigated in the development of Scenario 5: (1) water quality during the construction process, and (2) stability of relocated material after construction. Water quality issues would be important to river water users because pulp mills, domestic supplies and fisheries users rely on high quality (low turbidity) water for their operations. The mechanical approach was investigated because techniques involved have been used on many previous projects. Excavation would be conducted in dry conditions in the delta areas after lake levels are lowered. Operating in dry conditions would reduce the introduction of suspended material into the river flow and help protect water quality.

Both mechanical and hydraulic approaches in Scenario 5 use berms (dikes) constructed of granular materials, taken from the deltas, along the length of the river bank to help stabilize fine material. Stabilization would protect relocated material from future erosion and help reduce potential impacts to water quality and river aggradation. Various methods and levels of stabilization are possible. Stabilization with large rocks at the river face graded to smaller material away from the river would provide the highest level of protection from erosion. No level of stabilization would prevent all erosion, and over time some of the relocated material would move down river (hundreds of years for the highest level of stabilization).

An approach was developed designed to use standard earthmoving construction equipment and to ensure maximum stability of the relocated material. This approach used between 40 and 70 pieces of heavy equipment. The majority of material to be relocated lies in the upper delta portion of the lakes. To minimize costs the river channel in the delta area varied from approximately 80 feet wide at the mouth of Rica Canyon to 250 at the end of the delta. The channel width was increased to 500 feet wide through the remaining portion of the lake. This approach resulted in relocating approximately 3.3 mcy of delta material and 2.0 mcy of silt and clay sized material.

Activities for this approach would be divided into two stages. The first stage would remove delta material from the new river channel and store this material adjacent to the channel. The lake level would be simultaneously lowered to the level of the silt and clay deposits, a depth of approximately 70 feet. Material in this region of the lake consists of mainly sand and gravel. The excavation would be accomplished using mechanical excavators such as very large backhoes and cranes. Some excavated material would be separated by size. Larger material would be stored for future use as scour protection. Instead of temporarily storing it, material could be placed on barges and bottom dumped in locations which would form berms to stabilize silt and clay material after lowering the lakes. Silt screens would be used to help reduce introduction of suspended material into the water column.

This first phase of construction would coincide with river diversion construction. Personnel and equipment would be transported by barge from the dam area to the upper parts of Lake Mills. Some road work could be required to get heavy equipment into the Lake Mills area. Access to the delta region of Lake Aldwell is available by land route. A launching site would be constructed near the dam with a floating or movable pier which would be used to access a barge. The same arrangement would be made at the construction site.

When river diversion for dam demolition was complete and a channel excavated through the delta region of the lake, the second phase of construction would begin. This would involve using hydraulic dredges to remove material on the bottom of the lake in the path of the new river channel, prior to lowering the lake water levels.

Material deposited in the lake bed area consist of mainly very small silt and clay particles, which when disturbed, would become suspended and tend to increase the turbidity of the water. This layer of fine material is about 10 feet thick and has the consistency of mud. Material would be dredged from the lake bottom and pumped into cells constructed in phase 1.

These cells serve three essential purposes: (1) they surround the sludge and contain it while it dewaters and consolidates; (2) they stabilize the areas adjacent to the new river flood plain so that even in the event of a flood, during or after construction, the adjacent banks would not rapidly erode and carry unwanted material down the river, and they also stabilize the river alignment so planting of this area can occur; and (3) they serve as haul roads so that material can be transported during construction from the previous storage sites.

Relocated material would gently slope starting at the edge of the floodplains. The slopes would rise approximately 1 foot for every 4 horizontal feet. The surface of the relocated areas would be covered with a layer of granular material taken from the delta areas. This material would be used to ensure that the proper substrate for revegetation is available. Planting of the dredged material and berm slopes would start at the beginning of the construction process and continue throughout. When the excavation and sediment stabilization are complete, dam demolition would begin.

Hydraulic Dredging. This approach relies on submersible pumps to dredge, transport and place sediment in both the delta and lakebed regions of the reservoirs. Most features of the previous approach are similar except that delta material would be (1) deposited under water and (2) hydraulically dredged rather than mechanically excavated. Hydraulic dredging potentially offers a cleaner, less expensive process.

Instead of lowering lake levels to operate in the dry, lake water levels would remain at about their present elevations during dredging of the delta sediments. Hydraulic dredges mounted on barges would remove the sand/gravel material, pump it down the lake and deposit it underwater into piles, later to be used as containment berms. Sediment curtains suspended downstream of the deposition site would help prevent any fine sediment put into suspension by this process from passing the dam.

As the channel is excavated, the lake level would be lowered. Existing penstocks would be used to lower reservoir levels to the bottom of the delta. Dredged material would be pumped downstream and deposited underwater on either side of the channel in the current lakebed areas. Containment cells would be formed by the deposition of the redeposited material. Sediment curtains would be positioned around the deposition sites to reduce the amount of suspended material resulting from underwater deposition of dredged material. Curtains would be suspended by floats at the top and anchored on the bottom.

When dredging of the delta channel is complete, water levels in the lake would be lowered exposing containment cells. As containment cell material is drained and compacted, delta channel sides slopes would be graded and protected from scour. Submersible barge mounted dredges would remove the fine sediments in the lakebed areas and place them in containment cells. All but the extremely fine particles would settle in water within the containment cells. Slurry from the dredge pumps would consist of approximately 75% water and 25% solids. Water would seep trough the cell walls containing solid material.

Fine sediments in the containment cells would be drained and compacted. A layer of granular material would be placed over compacted lakebed sediments. This material could be placed with either mechanical equipment or pumped in a slurry. Vibratory or roller compactors would stabilize the material after placement of the top layer. Revegetation would proceed after compaction.

Discussion of Similar Projects. Concern for suspended sediment control has dictated that construction practices similar to those proposed for the hydraulic approach to Scenario 5 be used. A partial dam removal and reconstruction project conducted in 1986 through 1988 by B.C. Hydro in British Columbia successfully employed the elements of construction described above. Downstream water use was nearly identical to the Elwha, including fisheries, domestic, and pulp mill users.

Turbidity (suspended sediment) standards during construction were developed and enforced by the Government of Canada's Department of Fisheries and Oceans (DFO). Fine material was dredged and redeposited in the reservoir under water upstream of an earthen dam. Turbidity monitoring devices located at the dam monitored turbidity levels as water passed over the dam. Requirements set by DFO allowed turbidity levels to increase by 25 mg/l over the levels of the undisturbed water (background levels) flowing into the reservoir. A monitoring device was placed upstream of the construction site to determine inflow turbidity levels. Discussions with B.C. Hydro and DFO indicate that construction was halted, briefly, only two times due to unacceptable turbidity levels.

Advantages

- This approach would produce the least amount of suspended sediment due to construction, of the approaches investigated.
- This is potentially the least cost approach. Uncertainties presented in the *Erosion* approaches make cost estimations and comparisons difficult.
- The time required is relatively short. With adequate manpower and equipment, construction could be conducted simultaneously at both dams and completed in 3 to 5 years.
- This approach has been used on other similar projects. Cost, schedule, configuration of the final project and water quality estimates would be based on past performance. Results would be predictable.

Disadvantages

- Material would remain near present locations in Olympic National Park.
- Heavy equipment (dredging) would be required to conduct the work. This could result in minor temporary impacts to noise and air quality.

Use Erosion to Relocate Material Adjacent to New River Channel. An investigation was conducted to determine the potential to use river erosion to relocate granular material into new river channel overbank areas. The objective was to determine the potential for cost savings resulting from using river transport capacity to move delta material instead of using dredges or mechanical earth moving techniques. This approach proved not to be technically feasible as a stand alone approach. To some extent material can be relocated using river transport, however, other methods, mechanical or hydraulic, would have to also be employed to remove required sediments. Scenario 6 describes a method using dredges to relocate eroded material from the delta.

SCENARIO 6 - Erode Delta to Stable Profile, Retain and Relocate Gravel, Silt and Clay in Lake Area

Lake Mills

Naturally erode coarse material in delta to stable slopes; use hydraulic dredges to relocate in reservoir.
Fine material relocated in reservoir.

Lake Aldwell

Use hydraulic dredges to relocate coarse and fine material in reservoir.

Costs and impacts to the riverine area in the Park could be reduced if most of the material in the delta area of Lake Mills were to remain in place. Scenario 6 seeks to establish the location of a stable riverbed elevation through the delta created by erosion which would move the least amount of material. While the vertical location of the riverbed would not be stable indefinitely as no feature of the river is, it was assumed for this investigation that change would occur slowly after the bottom was armored and the side slopes were protected in the delta area.

The volume of material relocated from Lake Mills delta presented in this approach, would be the smallest quantity that could be removed and still maintain a stable riverbed location. Scenario 6 differs from Scenario 5 in its use of river flow to erode a channel through the delta and that it moves a smaller quantity of material from the delta than Scenario 5.

Drawdown experiments performed by the dam owner at Lake Mills (Hosey 1990) confirmed that the river has sufficient energy to cut through the heavier delta sediments and carry them a short distance downstream. Also, the river cuts a vertical notch through the sediments, which results in an unstable slope condition. Mass excavators would be used to push the side slope material into the river to create stable channel contours. Eroded material would either be stabilized or relocated to form containment cells.

Control of the erosion process would be managed and aided by the uses of submersible pump dredges. Most eroded material would not be transported to locations required for containment cell construction. Submersible dredges would be used to relocate this material to form containment cells.

HEC-6 studies indicate the riverbed would become stable at approximately 0.6% through the center of the delta. At the upstream and downstream ends of the delta, the slope stabilized at approximately 3% slope and occurred approximately one year after the erosion process had begun.

Several channel sizes were investigated to determine the effects of width on stability. Ranges from 150 to 500 produced about the same results. A 250' channel was used for cost and construction investigations through the delta region. Side slopes would be formed at 4 horizontal to 1 vertical. This configuration would require the removal of approximately 3.3 million cubic yards of material from the delta.

The outlet of the erosion channel would be directed to the left overbank of the downstream channel. Submersible pump dredges, operated by a barge mounted crane, would be positioned near the channel outlet. As the sediment is deposited, the dredged material would be pumped through a flexible sediment pipeline and redeposited downstream on either side of the transitional delta erosion channel. As the lake level is incrementally lowered, eroded material would create an extension of the erosion channel. Two dredges would be required during this procedure with a third barge used for positioning guy wires of the dredge barges.

As the controlled erosion and deposition proceeded downstream, the containment cells would be constructed. Existing stable canyon walls would form one wall of the cell. The berms created by redepositing dredged material would act as the remaining cell walls. Final shaping and grading of the containment cells would be accomplished by mechanical equipment completed in the dry.

Delta material is predominantly coarse material mixed with as much as 25% fines. Erosion of the delta would introduce these fines into the water column. Analysis indicates that over the 12 month erosion period, suspended sediment concentration levels past Glines Canyon Dam would average 178 ppm, peaking at 1359 ppm during high flow periods. These estimates are based on assumptions about background turbidity levels above the dams. Data on natural background turbidity levels (without dams) has not been gathered. Due to the low dam trapping capacity for clay sized particles (10% estimated by HEC-6), background turbidity levels could vary widely and not significantly affect results predicted material volumes trapped in the reservoirs.

Fine sediment from the lower reaches of the lakes would be removed after erosion of the delta was complete. Fine sediments would be dredged prior to lowering lake levels and pumped into previously constructed containment cells.

Dredges can be expected to move from 60 to 100 cy of solids per hour. At this rate, two dredges could remove the 2.8 million cubic yards of fine sediment in the proposed channel within an 18 month period if operating 20 hours per day. The dredges would be maneuvered from a sectional barge using a small crane. Guy wires and winches are used for barge positioning.

Advantages

- Less delta material is relocated than in other approaches. Relocating less material should result in lower costs.
- Turbidity levels in the downstream river would be smaller than those for the *Erosion* approaches because only material in the delta would be eroded.

Disadvantages

- Accurate prediction and cost and construction effort estimates would be difficult to develop.

- Erosion of the delta would inherently increase the levels of turbidity during construction. When compared to Scenario 5, approximately 500,000 more cubic yards of material (due to silt and clay trapped in the delta area of Lake Mills) would be introduced into suspension.

- No certain method (without artificially armoring the channel) is available to ensure the predicted river profile. Upon achieving the predicted "stable" channel profile, construction personnel would probably be required to be on standby for some time to help secure banks from unanticipated erosion caused by shifts in the channel.

4. COMBINATION APPROACHES: The previous discussions delineate various basic approaches to sediment management. Combinations of these basic approaches are also possible. While many conceivable combinations would be possible not all would be practical from construction, cost and environmental perspectives. Scenarios 7 through 9 suggest other possible combinations (see Figure F-32).

SCENARIO 7

Lake Mills

Coarse material eroded to stable condition and relocated in reservoir.
Fine material eroded to saltwater.

Lake Aldwell

Coarse material relocated in reservoir.
Fine material eroded to saltwater.

The elements of this approach have been previously discussed. This Scenario would use river flow to erode and carry fine material to the Strait of Juan de Fuca. Dredges would remove fine material in the lake bed areas and pump them directly into the river for transport. Coarse material in the Lake Mills delta would be eroded to a stable profile as discussed in Scenario 6. Coarse material transported into the lakebed areas would be relocated by hydraulic dredges or mechanical equipment. In Lake Aldwell, coarse material erosion would not be effective. Dredges would be used relocated delta material.

Advantages

- Less delta material is relocated than in other approaches. Relocating less material should result in lower costs.

- All lakebed material would be removed from the reservoirs. Except for the total removal approaches (Scenarios 1, 2, 8, and 9), this approach would produce the widest floodplain in the Lake Mills area. Greater area would result from removing all lakebed material and relocating smaller quantities (approximately 3.3 million cy) of delta material.

Disadvantages

- Accurate prediction and cost and construction effort estimates would be very difficult to develop.

- Turbidity levels would be high during removal of the silt and clay, so water users would require temporary protection.

- No certain method (without artificially armoring the channel) is available to ensure the proper profile. Upon achieving the predicted "stable" channel profile, construction personnel would probably be required to be on standby for some time to help secure banks from unanticipated erosion caused by shifts in the channel.

SCENARIO 8 - Remove Delta Material to Terrestrial Site, Erosion of Fine Material

Lake Mills

Remove all coarse material in reservoir to terrestrial site.
Fine material eroded to saltwater.

Lake Aldwell

Remove all coarse material in reservoir to terrestrial site.
Fine material eroded to saltwater.

Scenarios 8 and 9, like Scenarios 1 and 2, remove all trapped material from the lake areas. Mechanically removing material is an expensive approach. By washing part of the lakebed material downriver, costs can be reduced. Relocating and stabilizing lakebed material, either by hydraulic dredging or by mechanical excavation, is difficult due to the nature of the material.

In Scenarios 1 and 2, considerable time would be required for the material to drain and stabilize before it could be mechanically excavated. Scenarios 8 and 9 would eliminate the need to stabilize this material. A variation of this approach would relocate only a portion of the delta material upland. Cost estimates were prepared by combining information developed by the dam owner and estimates made as part of this report.

Advantages

- These approaches use techniques that have been used in the past on other similar projects. Construction techniques are predictable and controllable.

- The final configuration in the Lake Mills are after all removal would closely approximate predam conditions. Spawning habitat in the lake regions could be restored. Most of the material would be removed from the affected areas.

Disadvantages

- Although analytical tools are available to help predict the location of the eroded river profile, anticipating construction effort and developing cost estimates would be very difficult.

- Erosion would inherently increase the levels of turbidity during construction. Turbidity levels are predicted to be as high as 1500 mg/l during the erosion process. Increased suspended sediment levels could significantly impact fish habitat and health during the removal period, cause impacts to living marine resources, and impact water quality for the pulp mills. Water supplies would probably need to be modified or relocated.

SCENARIO 9 - Remove Delta Material to Saltwater Site, Erosion of Silt and Clay

Lake Mills
Remove all coarse material in reservoir to saltwater site. Fine material eroded to saltwater.

Lake Aldwell
Remove all coarse material in reservoir to saltwater site. Fine material eroded to saltwater.

Scenario 9 is identical to scenario 8 except that delta material would be deposited in saltwater. Cost for this approach would increase when compared to Scenario 8 because of the additional handling effort required. However, if an acceptable deposition site could be found, impacts might be decreased.

5. COST ESTIMATES: As a basis for comparison, reconnaissance level cost estimates based on 1992 dollars were prepared for all of the *Sediment Management* scenarios discussed in this report. Costs include a minimum of 25% contingency factors. Contingencies are higher for approaches using *Erosion* because the process is inherently more difficult to control and estimate. Although the data are incomplete, the best available information (Hosey 1990) was used in approximating sediment characteristics, gradations, and volumes, although Hosey (1990) did not gather sufficient data in Lake Aldwell to develop accurate cost estimates. Accurate estimates of the composition and volume of trapped sediment and are not available at this time. Results from the HEC-6 analysis were used to estimate volumes based on river erosion capabilities, suspended sediment levels, sediment transport potential, and aggradation locations in the river.

Itemized costs for Scenario 1 and Scenario 2 were taken from Hosey (1989). However, total sediment removal costs, summarized below, are different from those in Hosey (1989) due to exclusion of revegetation cost and differences in the estimated quantities of material required to be removed. All estimates include engineering, construction management, profit, and contingencies. Permitting and river revegetation costs were not included in these estimates. Revegetation costs can be found in Appendix H.

Costs for the *Erosion* approaches, Scenarios 3 and 4, were based on the assumption that material trapped between the dams or downstream of the Elwha dam would need to be managed with dredges or mechanical equipment. Contingencies for these approaches were high due to uncertainties that exist when predicting flows and sediment transport capabilities of the river. No cost for future river maintenance is included in the cost estimates. For *Removal* estimates, no maintenance should be required. The extent of future river maintenance would depend on the level of scour protection incorporated into the design for *Retention* approaches.

Construction procedures and costs for *Retention*, Scenario 5, were investigated in the greatest detail. Construction costs are based on current dredging technology. The applicability of these methods for this application is supported by the results obtained from similar projects. Unit costs for equipment and operation were taken from discussions with dredging contractors, equipment suppliers, and estimating manuals. Scenarios 6 through 9 combine unit costs developed for the previous five scenarios.

6. RECOMMENDED APPROACH: Four approaches to *Dam Removal* and 9 approaches to *Sediment Management* have been presented and discussed. These approaches attempt to investigate the range of practical solutions to dam removal and to river restoration on the Elwha River. When these approaches are combined, the cost of *Dam Removal* plus *Sediment Management* ranges from \$66.7 to \$236.1 million. The higher cost is associated with total removal of trapped material, Scenario 2. The significant cost savings associated with Scenarios 5, 6 or 7 for *Sediment Management* would appear to justify further investigation of these approaches. Assuming one of these approaches is used and the least expensive approaches to *Dam Removal* are used, the cost range for both activities should be \$66.7 to \$80 million.

Without specific design criteria and objectives, final recommendations for a specific *Sediment Management* solution cannot be made. However, based on the considerations discussed above, three approaches for *Sediment Management* appear to provide the most desirable results. Scenario 7 is the least cost approach and it retains the least amount of trapped sediment in the Lake Mills area except for the *Removal* approach. However, further study of protection to river water users during construction is necessary. To a lesser extent, Scenario 6 would also be limited by these same issues. If protection of downstream water users could be provided, Scenarios 6 and 7 should be investigated further.

This report considers Scenario 5 to offer the greatest protection to water users. However, this scenario would not restore the reservoir areas to their pre-dam condition since large quantities of sediment would remain in the lake areas. On the other hand, the river channel created under Scenario 5 would be sufficient to safely accommodate flood flows, allow the passage of fish, support revegetation, and remain relatively maintenance free. Long-term stability of the channel would depend on the objectives. Erosion and scour protection of relocated sediments is included as part of the cost estimates presented.

FIGURE NO.

F1

ELWHA RIVER RESTORATION
GLINES CANYON DAM
SITE PLAN

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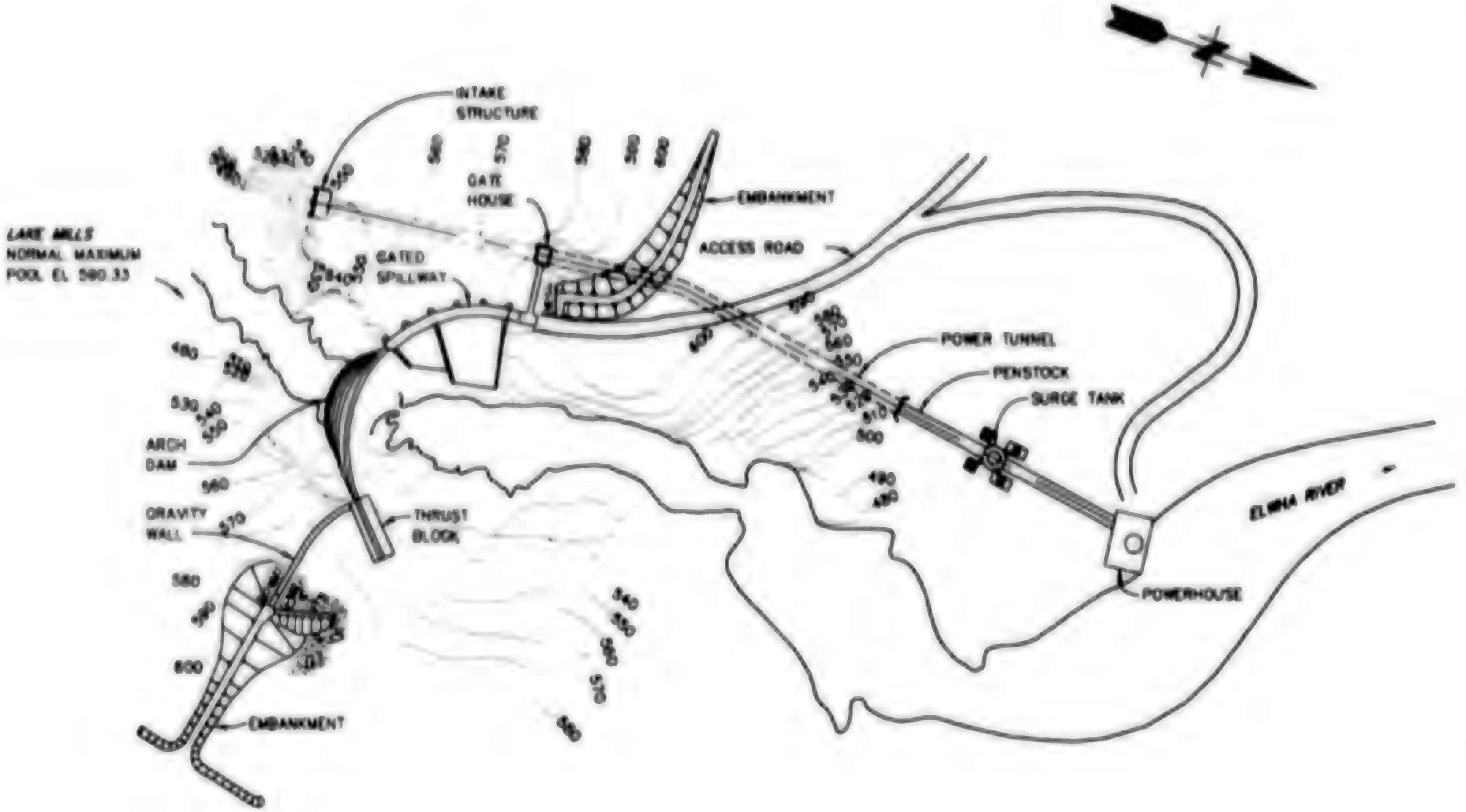
R.W. BECK
AND ASSOCIATES



NOTE

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929; PROJECT VERTICAL DATUM IS 19.67 FEET HIGHER THAN M.S.L.

GRAPHIC SCALE:

100 0 100 200

1" = 100'

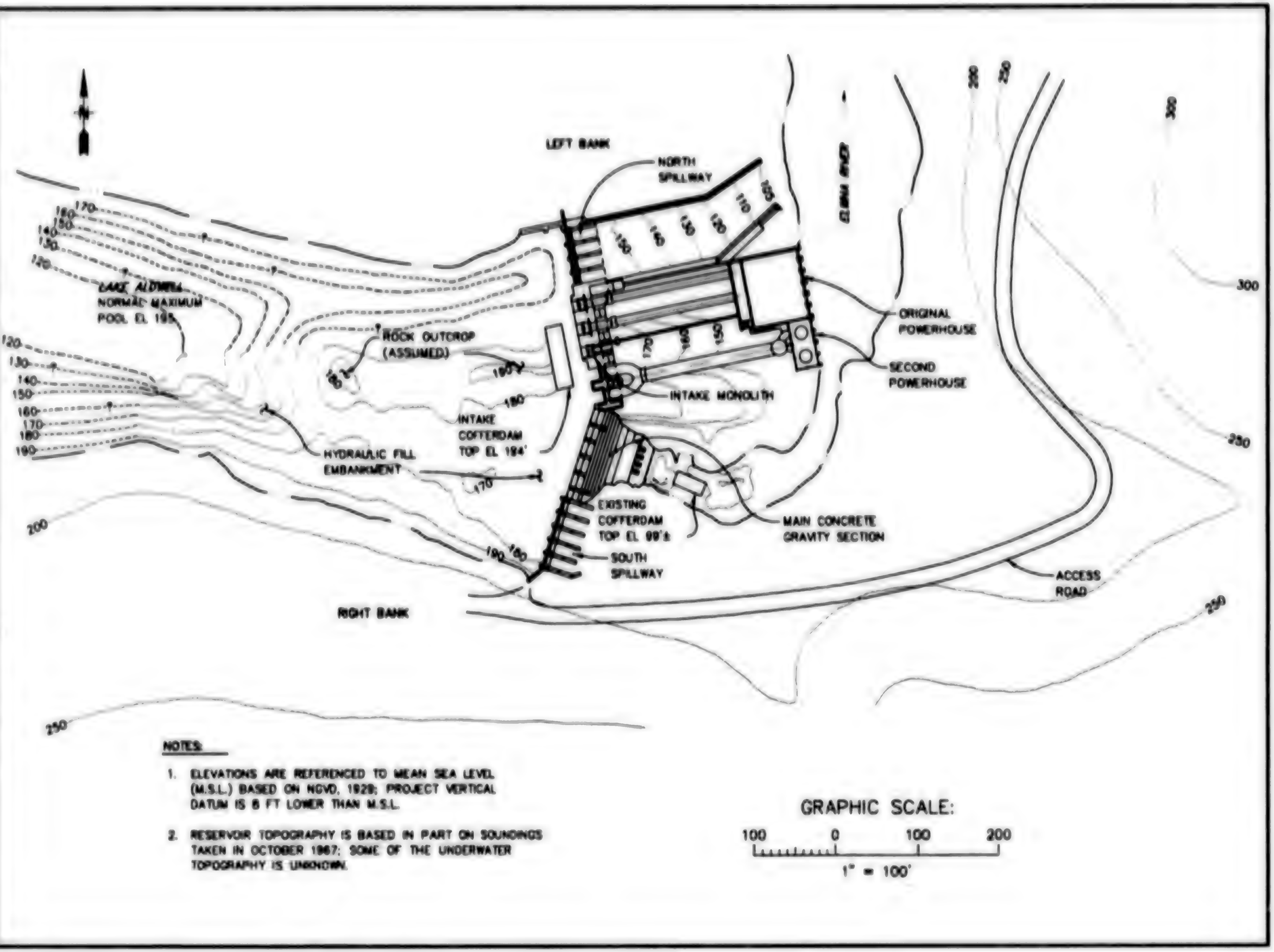
FIGURE NO.

F2

ELWHA RIVER RESTORATION
ELWHA DAM
SITE PLAN

SUMMIT TECHNOLOGY

R.W. BECK AND ASSOCIATES



NOTES:

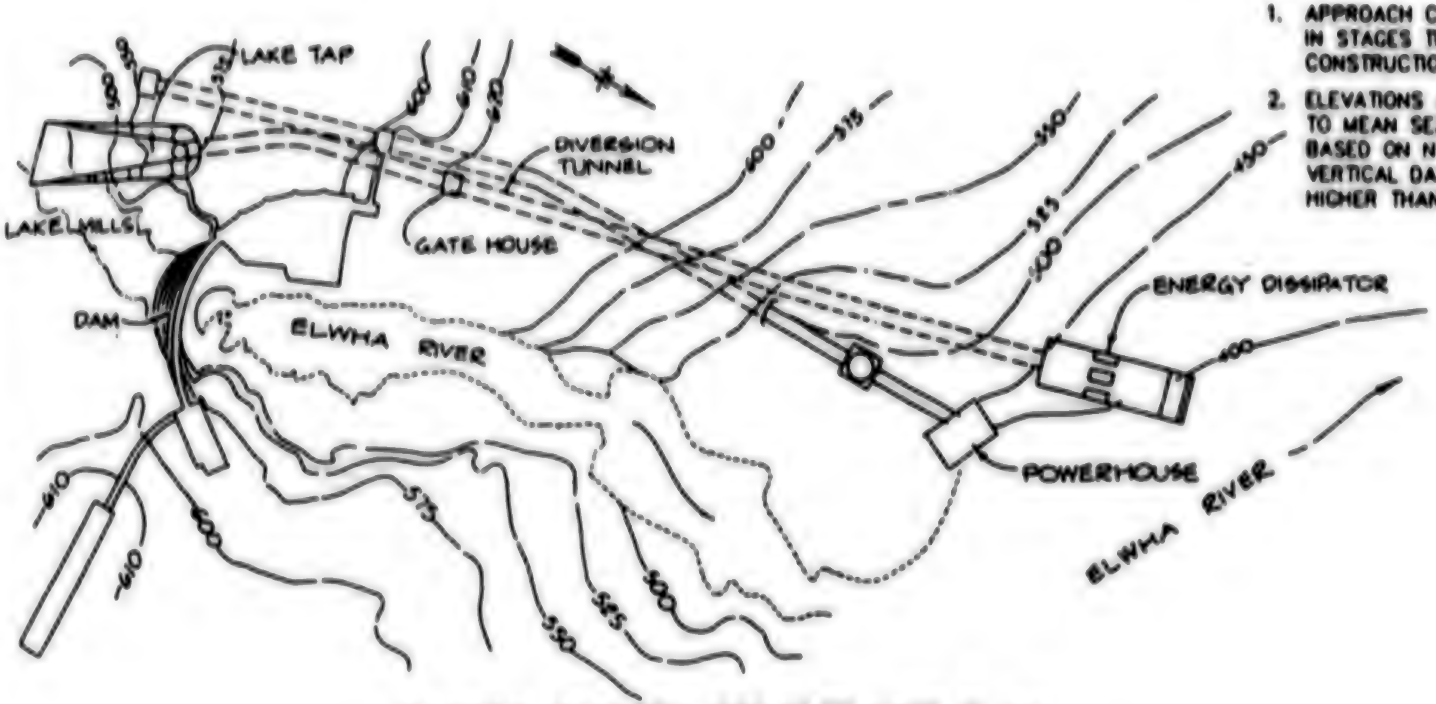
1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.

2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1967; SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.

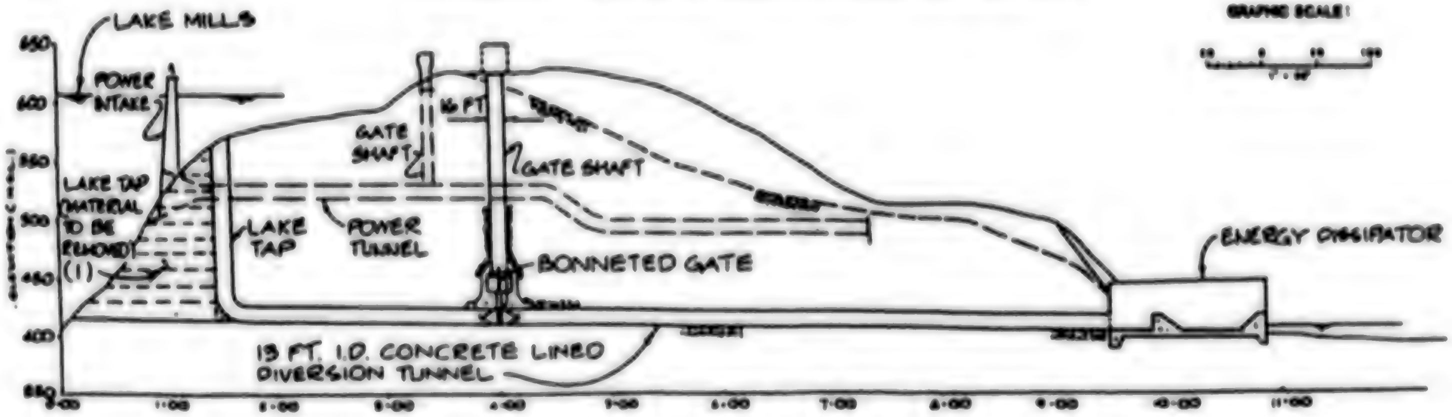
71

NOTES:

1. APPROACH CHANNEL IS EXCAVATED IN STAGES THROUGH DURATION OF CONSTRUCTION WORK.
2. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929; PROJECT VERTICAL DATUM IS 19.67 FEET HIGHER THAN M.S.L.



GLINES CANYON PROJECT SITE PLAN



DIVERSION TUNNEL PROFILE

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALTERNATIVE

FIGURE NO.
F3

SUMMIT TECHNOLOGY
CONSULTING ENGINEERS, INC. P.S.

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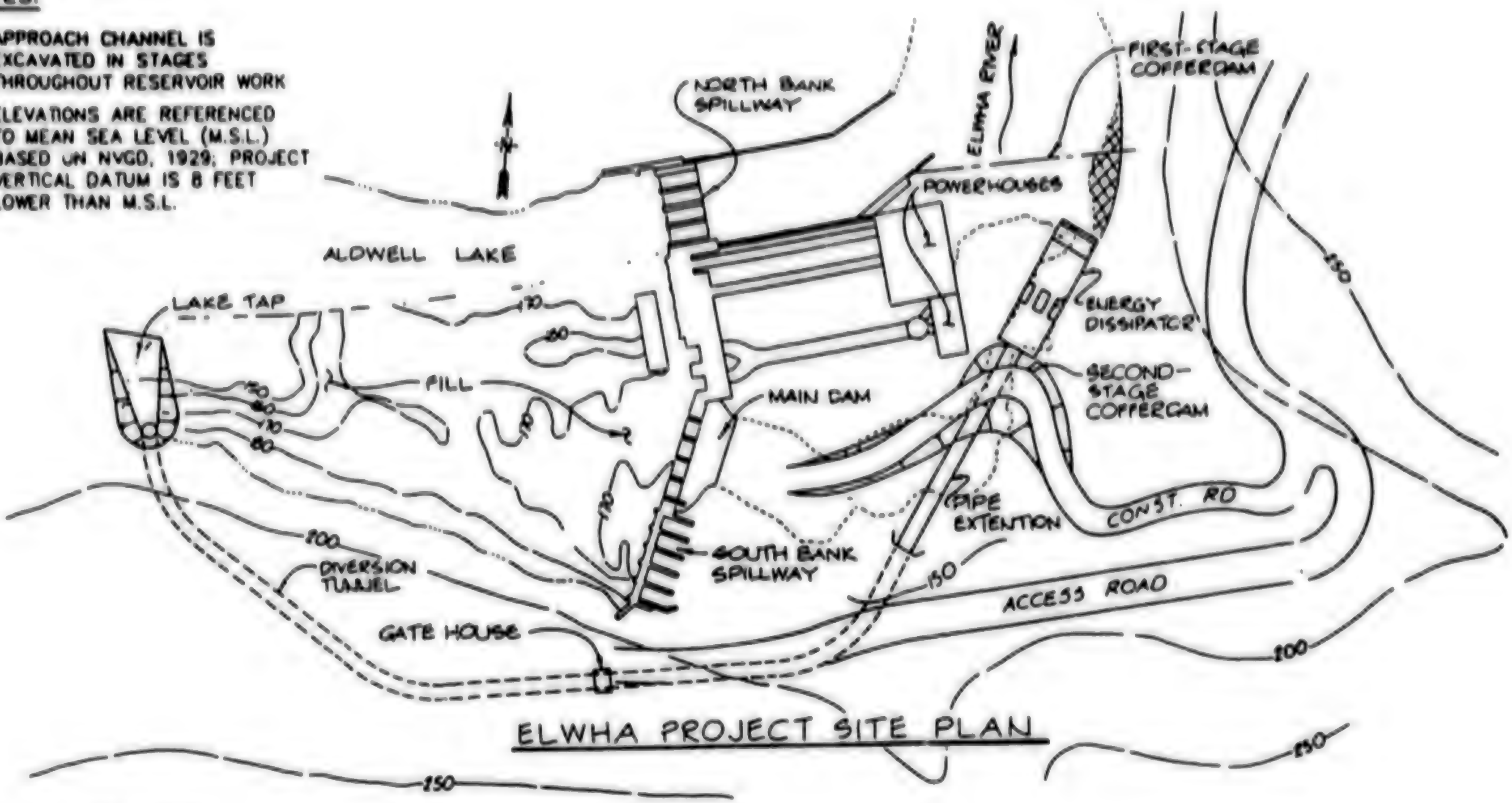
AND ASSOCIATES

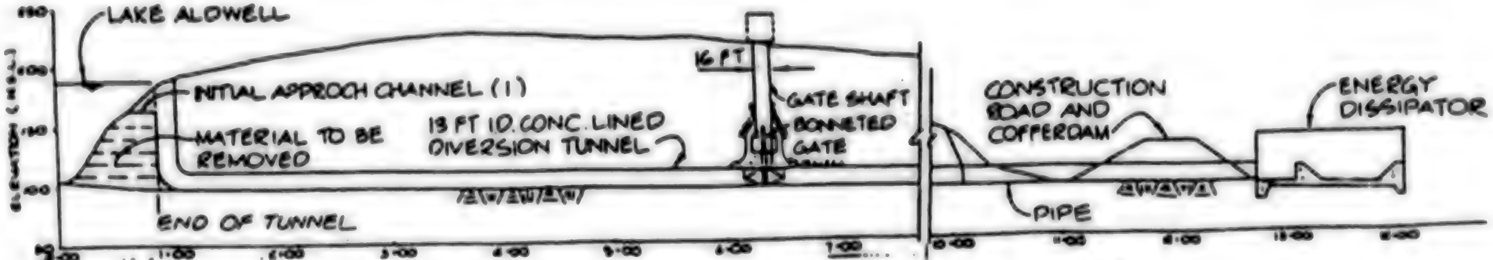
72

NOTES:

1. APPROACH CHANNEL IS EXCAVATED IN STAGES THROUGHOUT RESERVOIR WORK
2. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929; PROJECT VERTICAL DATUM IS 8 FEET LOWER THAN M.S.L.



ELWHA PROJECT SITE PLAN



DIVERSION TUNNEL PROFILE

FIGURE NO.

F4

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALTERNATIVE

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AND ASSOCIATES

FIGURE NO.
F5

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALT. - STEP 1 OF 5

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CONSULTING ENGINEERS, INC. P.S.

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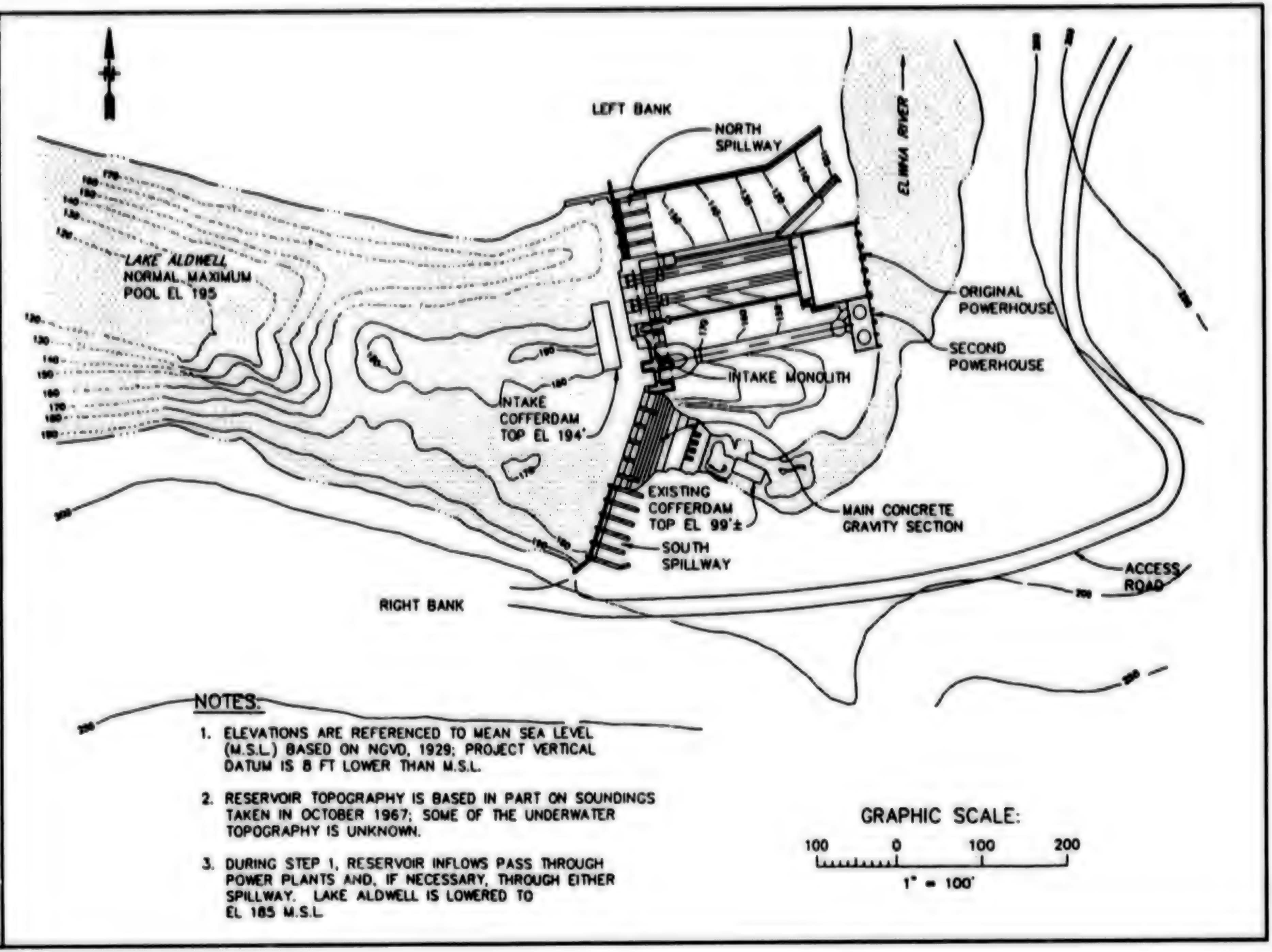
AND ASSOCIATES



NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.
2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1967; SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.
3. DURING STEP 1, RESERVOIR INFLOWS PASS THROUGH POWER PLANTS AND, IF NECESSARY, THROUGH EITHER SPILLWAY. LAKE ALDWELL IS LOWERED TO EL 185 M.S.L.

FIGURE NO.
F6

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALT. - STEP 2 OF 5

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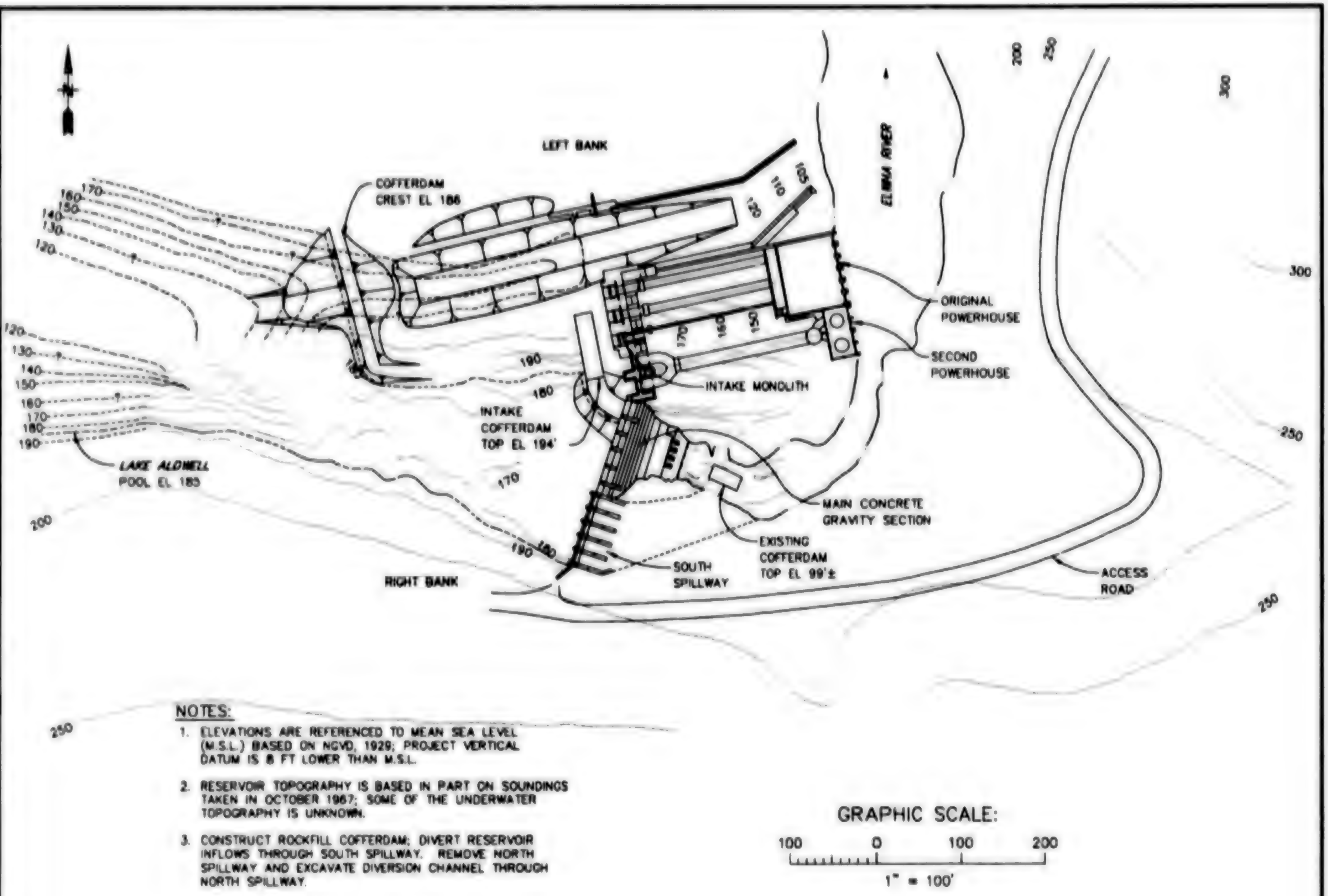
CONSULTING ENGINEERS, INC. P.S.

R.W. BECK AND ASSOCIATES



NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.

2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1967; SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.

3. CONSTRUCT ROCKFILL COFFERDAM; DIVERT RESERVOIR INFLOWS THROUGH SOUTH SPILLWAY. REMOVE NORTH SPILLWAY AND EXCAVATE DIVERSION CHANNEL THROUGH NORTH SPILLWAY.

75

FIGURE NO

F7

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALT. - STEP 3 OF 5

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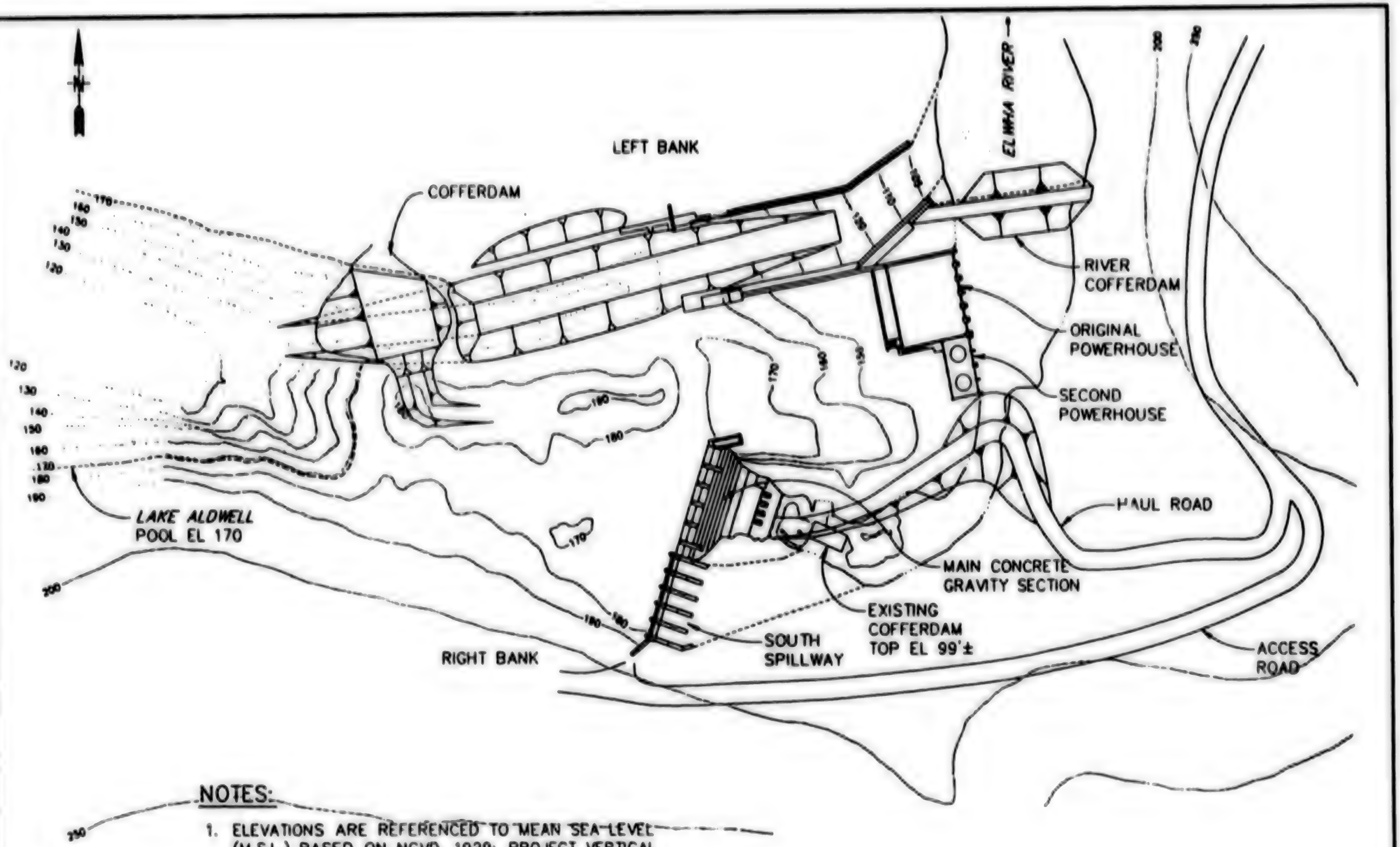

NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.

2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1967; SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.

3. DIVERT RESERVOIR INFLOWS THROUGH DIVERSION CHANNEL. LOWER RESERVOIR BY REMOVING COFFERDAM IN STAGES CONSTRUCT HAUL ROADS; REMOVE INTAKE MONOLITH AND PENSTOCK STRUCTURES.

GRAPHIC SCALE:

100 0 100 200

1" = 100'

76

FIGURE NO.

F8

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALT. - STEP 4 OF 5

SUMMIT TECHNOLOGY
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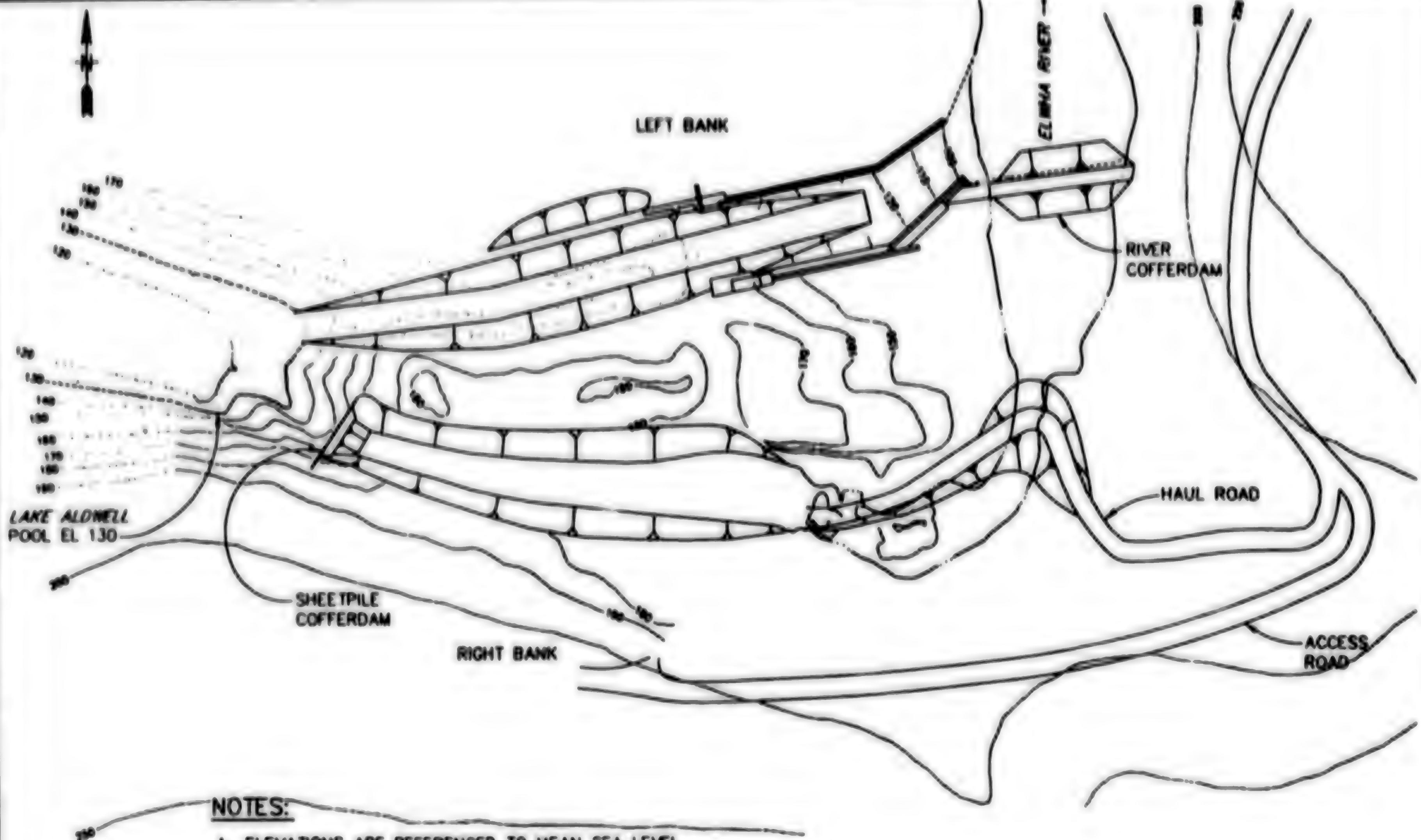
AND ASSOCIATES



NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.
2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1967; SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.
3. INSTALL SHEETPILE COFFERDAM; REMOVE REMAINING STRUCTURES; EXCAVATE HYDRAULIC FILL BEHIND MAIN CONCRETE GRAVITY SECTION.

GRAPHIC SCALE:

100 0 100 200

1" = 100'

77

FIGURE NO.

F9

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
DIVERSION CHANNEL ALT. - STEP 5 OF 5

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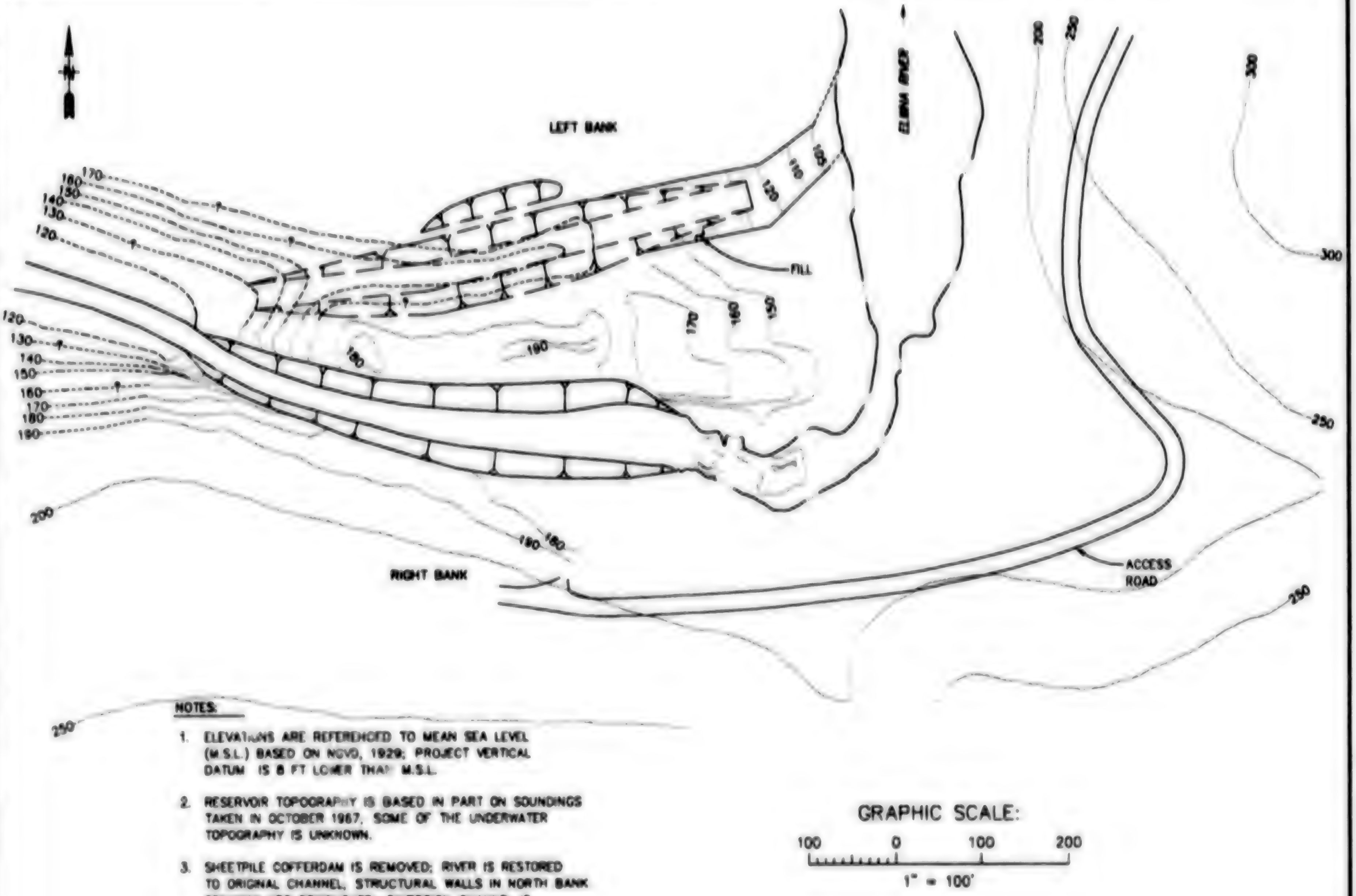


NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 8 FT LOWER THAN M.S.L.

2. RESERVOIR TOPOGRAPHY IS BASED IN PART ON SOUNDINGS TAKEN IN OCTOBER 1987, SOME OF THE UNDERWATER TOPOGRAPHY IS UNKNOWN.

3. SHEETPILE COFFERDAM IS REMOVED; RIVER IS RESTORED TO ORIGINAL CHANNEL, STRUCTURAL WALLS IN NORTH BANK SPILLWAY ARE DEMOLISHED; DIVERSION CHANNEL IS BACKFILLED; SITE IS REVEGETATED.

78

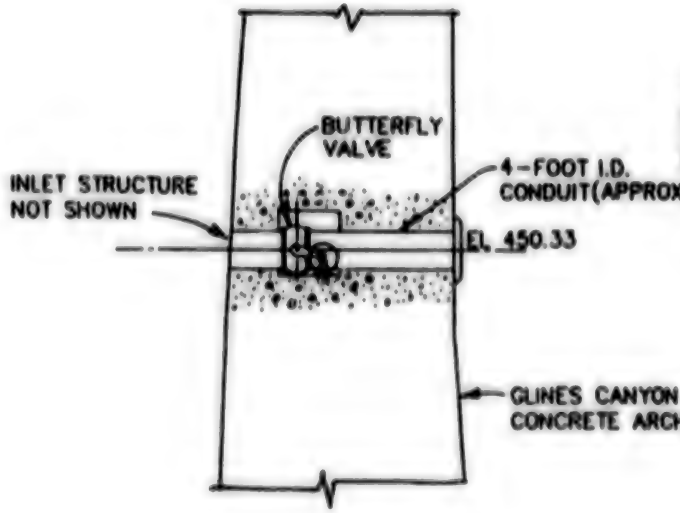
FIGURE NO.
F10

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
LOW LEVEL OUTLET FOR DIVERSION CONTROL

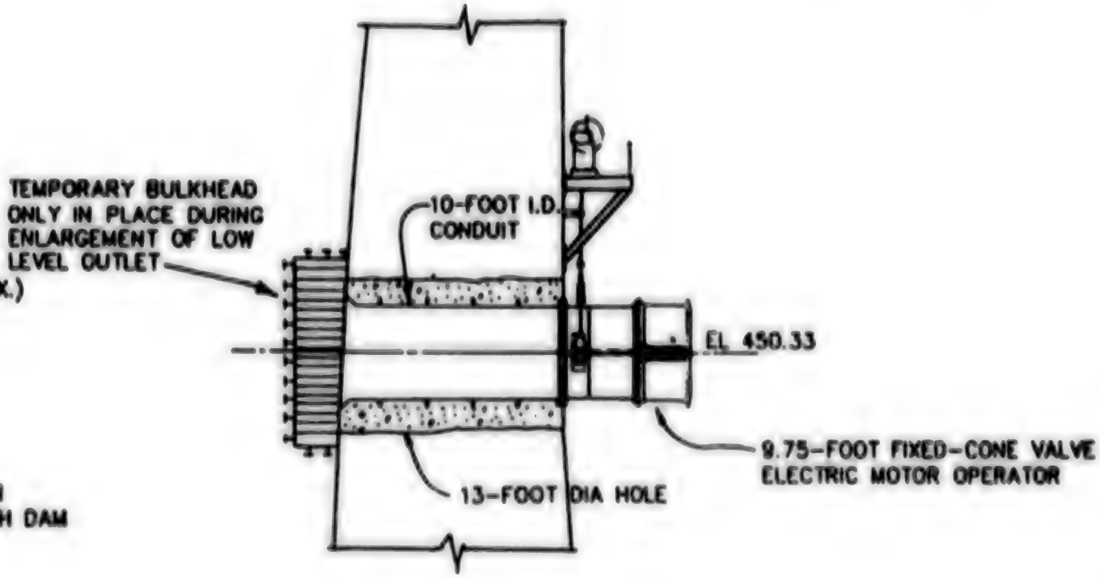
SUMMIT TECHNOLOGY
R.W. BECK AND ASSOCIATES

NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NGVD, 1929; PROJECT VERTICAL DATUM IS 19.87 FEET HIGHER THAN M.S.L.
2. LOW-LEVEL OUTLET DIVERSION WILL ALLOW DRAWDOWN TO ABOUT EL 460 MSL.


BUTTERFLY VALVE
INLET STRUCTURE NOT SHOWN
4-FOOT I.D. CONDUIT(APPROX.)
EL 450.33
GLINES CANYON CONCRETE ARCH DAM

EXISTING ARRANGEMENT


TEMPORARY BULKHEAD ONLY IN PLACE DURING ENLARGEMENT OF LOW LEVEL OUTLET
10-FOOT I.D. CONDUIT
EL 450.33
13-FOOT DIA HOLE
9.75-FOOT FIXED-CONE VALVE ELECTRIC MOTOR OPERATOR

9.75-FOOT FIXED-CONE VALVE
WITH ELECTRIC MOTOR OPERATOR

PROPOSED ALTERNATIVE

FIGURE NO.

F11

ELWHA RIVER RESTORATION
MAXIMUM DISCHARGE THROUGH
LOW LEVEL OUTLET

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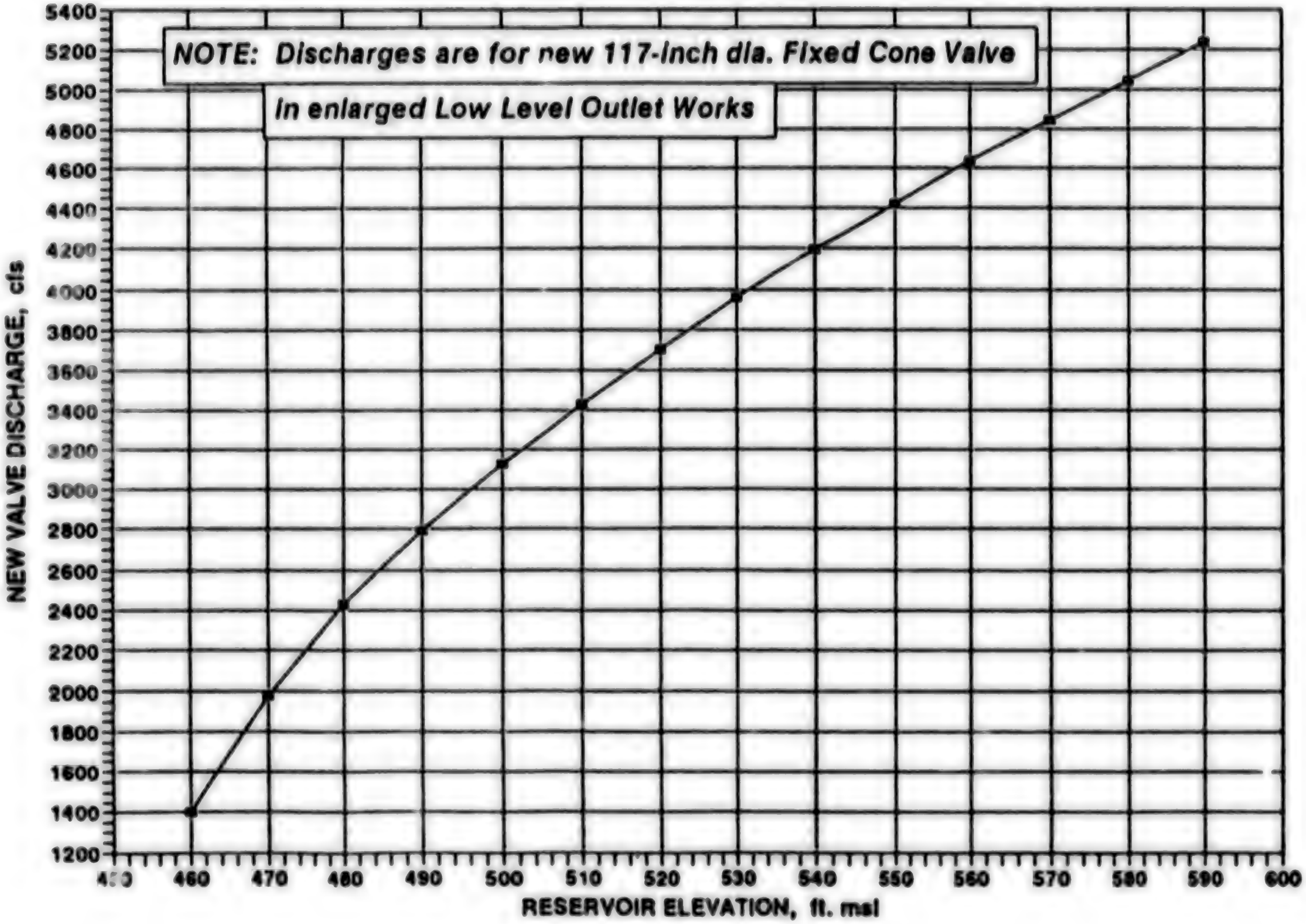
AND ASSOCIATES

GLINES CANYON HYDROELECTRIC PROJECT
MAX DISCHARGE THROUGH LOW LEVEL OUTLET



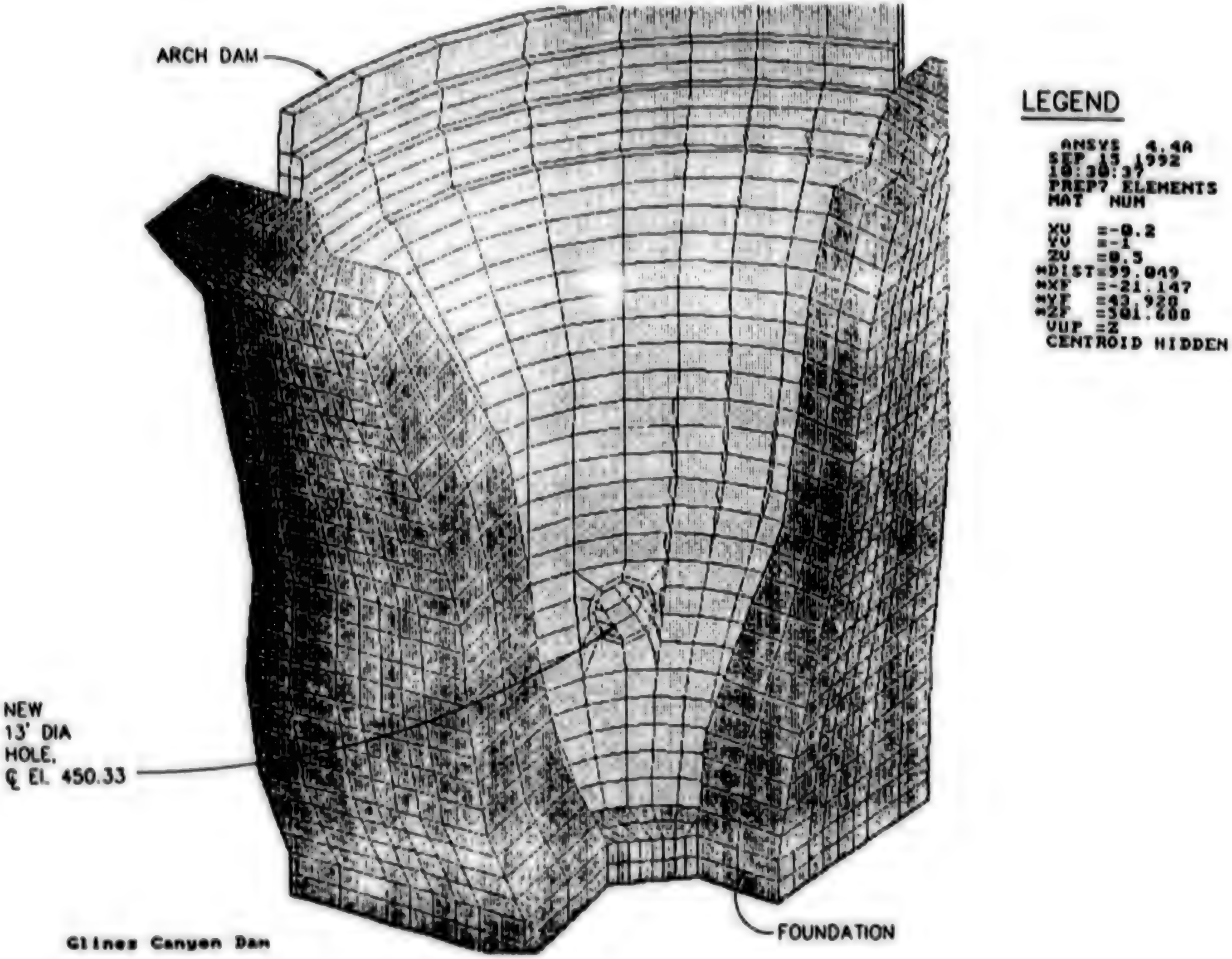


FIGURE NO.
F12

ELWHA RIVER RESTORATION
GLINES CANYON DAM WITH ENLARGED LOW LEVEL OUTLET - FEM MODEL

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AND ASSOCIATES

FIGURE NO.

F13

ELWHA RIVER RESTORATION
GLINES CANYON DAM WITH ENLARGED
LOW LEVEL OUTLET - FOUNDATION CONSTRAINTS

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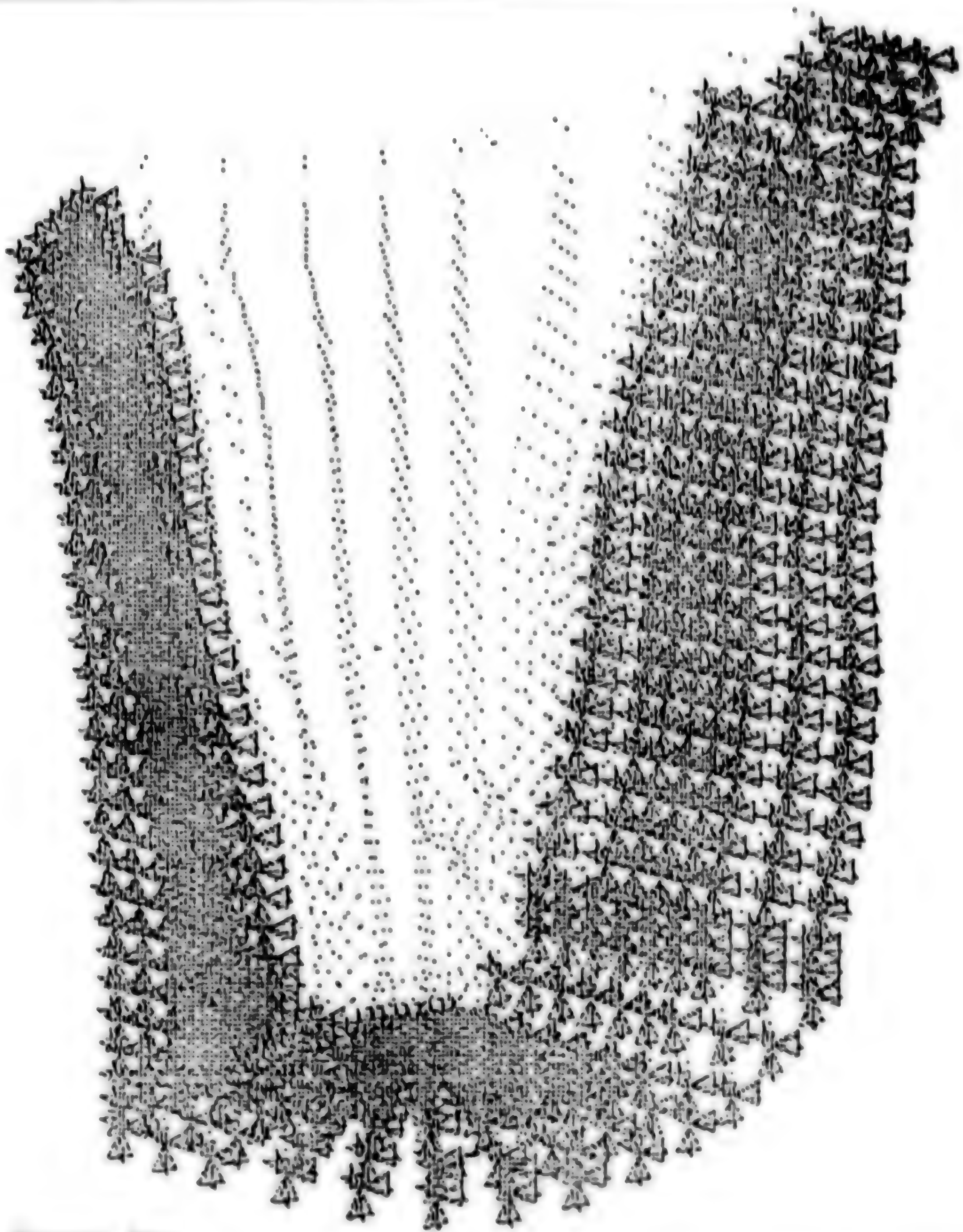

Glines Canyon Dam

LEGEND

```
  ANSYS  4.4A
 SEP 14 1992
 15:50:56
 PREP7 NODES
 TDIS

 XV   =0.3
 YV   =1
 ZV   =0.5
*DIST=127.027
*XF   =-3.529
*YF   =58.781
*ZF   =520.106
 VUP  =Z
 CENTROID HIDDEN
```

NOTES:

1. SAME VIEW AS FIGURE 5.
2. NODES ARE SHOWN WITH FOUNDATION CONSTRAINTS.

82

BLANK
PAGE

FIGURE NO.

F14

ELWHA RIVER RESTORATION
GLINES CANYON DAM WITH ENLARGED
LOW LEVEL OUTLET - HYDROSTATIC LOADING

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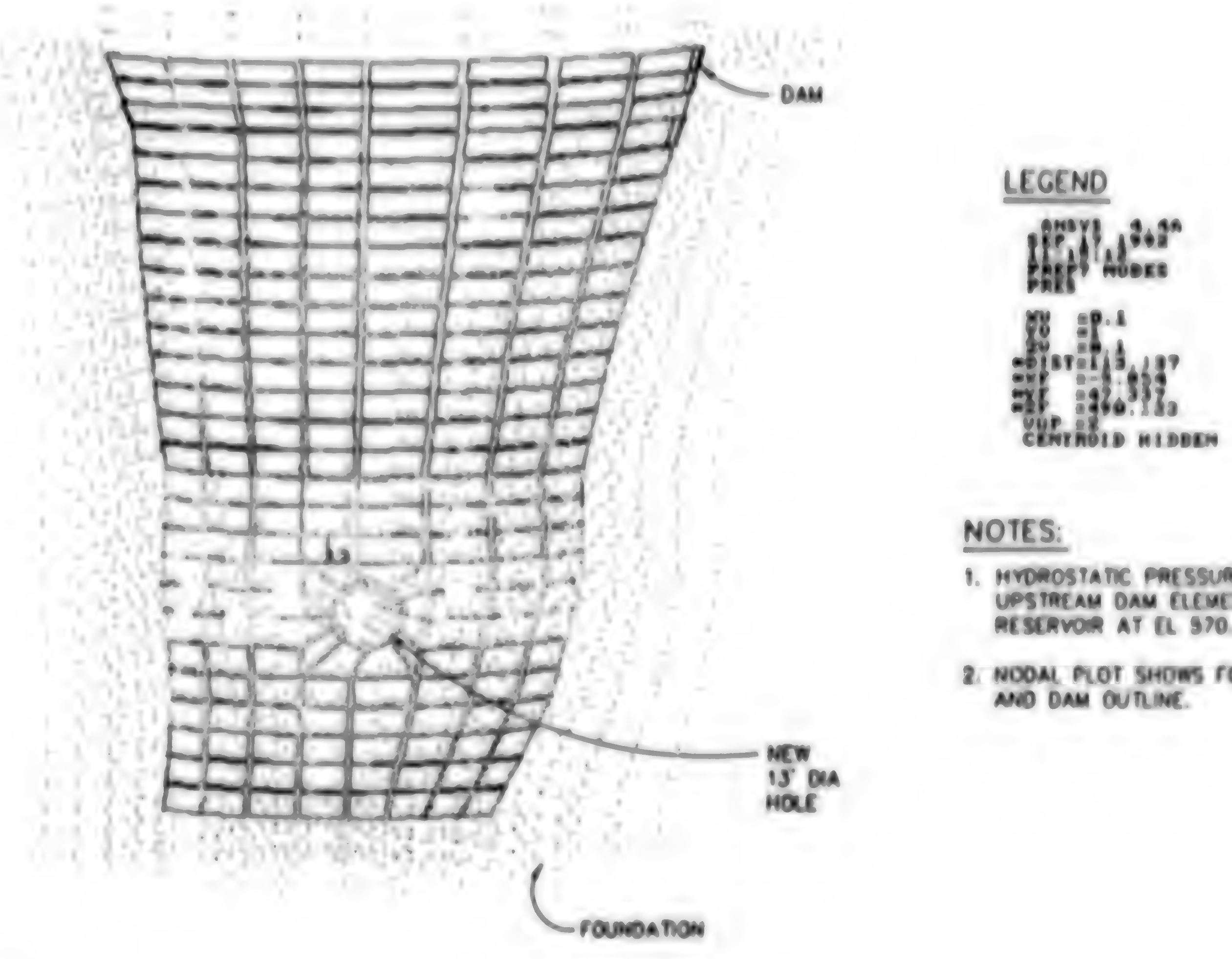

Glines Canyon Dam

NOTES:

1. HYDROSTATIC PRESSURE ON UPSTREAM DAM ELEMENTS, RESERVOIR AT EL 570.
2. NODAL PLOT SHOWS FOUNDATION AND DAM OUTLINE.

83

FIGURE NO.

F15

ELWHA RIVER RESTORATION
GLINES CANYON DAM W/ ENLARGED LOW LEVEL OUTLET DEFLECTORS - RESERVOIR AT EL 570

SUMMIT TECHNOLOGY

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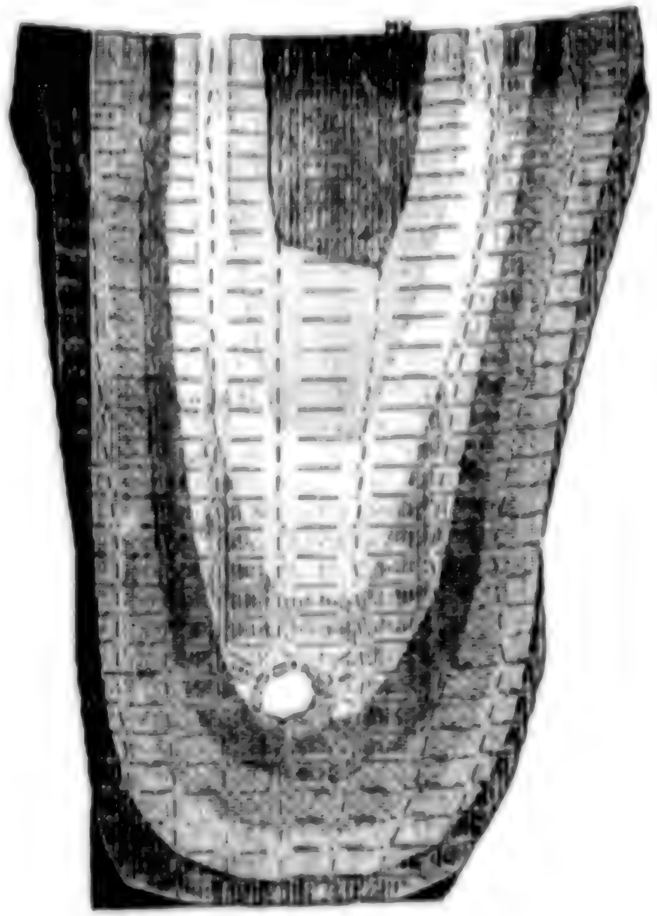


Glines Canyon Dam

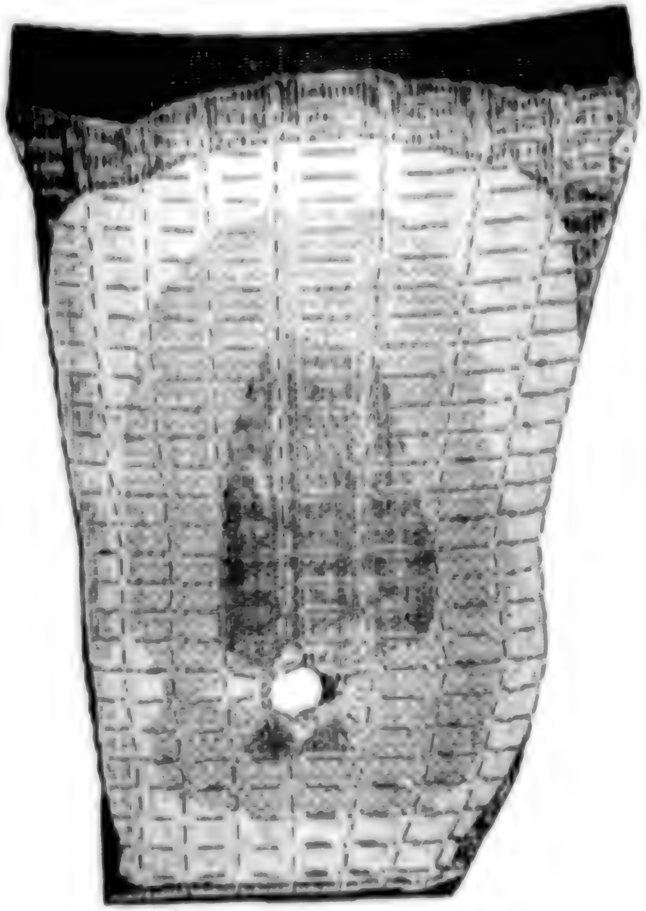
LEGEND

DEFLECTIONS

-0.134E-04
0.574E-03
0.001201
0.001808
0.002416
0.003023
0.003631
0.004238
0.004845
0.005452

NOTES:

1. RESERVIOR IS AT EL 570.
2. DEFLECTIONS ARE IN FEET. DOWNSTREAM DIRECTION IS POSITIVE.
3. FOUNDATION ELEMENTS ARE NOT SHOWN.



Glines Canyon Dam

NOTES:

1. MAXIMUM PRINCIPAL STRESSES ARE IN KIPS/FT² AT DOWNSTREAM FACE. POSITIVE VALUES ARE TENSION.
2. RESERVIOR IS AT EL 570.

FIGURE NO.
F16

ELWHA RIVER RESTORATION
GLINES CANYON DAM W/ ENLARGED LOW LEVEL OUTLET
MAXIMUM PRINCIPAL STRESS CONTOURS

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R.W. BECK AND ASSOCIATES

FIGURE NO.
F17

ELWHA RIVER RESTORATION
GLINES CANYON DAM W/ ENLARGED LOW LEVEL OUTLET
MAX. PRINCIPAL STRESS CONTOURS IN CROSS SECTIONAL VIEW

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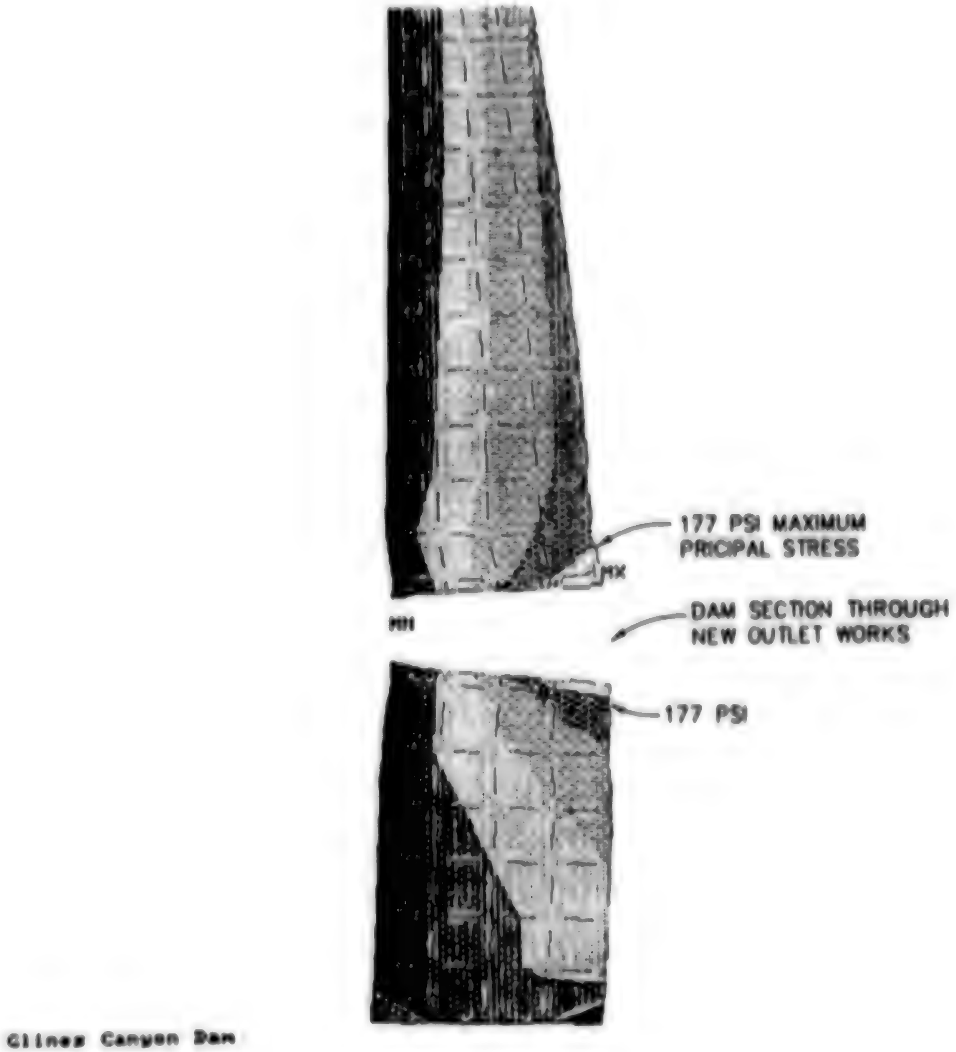

LEGEND

STRESSES
- -3.206
- 2.485
- 8.757
- 14.028
- 19.8
- 25.571
- 31.343
- 37.114
- 42.886
- 48.657

NOTES:

1. MAXIMUM PRINCIPAL STRESSE ARE IN KIPS/FT^2. NEGATIVE VALUES ARE STRESSES IN COMPRESSION, POSITIVE VALUES ARE STRESSES IN TENSION.
2. RESERVIOR IS AT EL 570.

FIGURE NO.

F18

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
EXISTING POWER TUNNEL HEADWORKS

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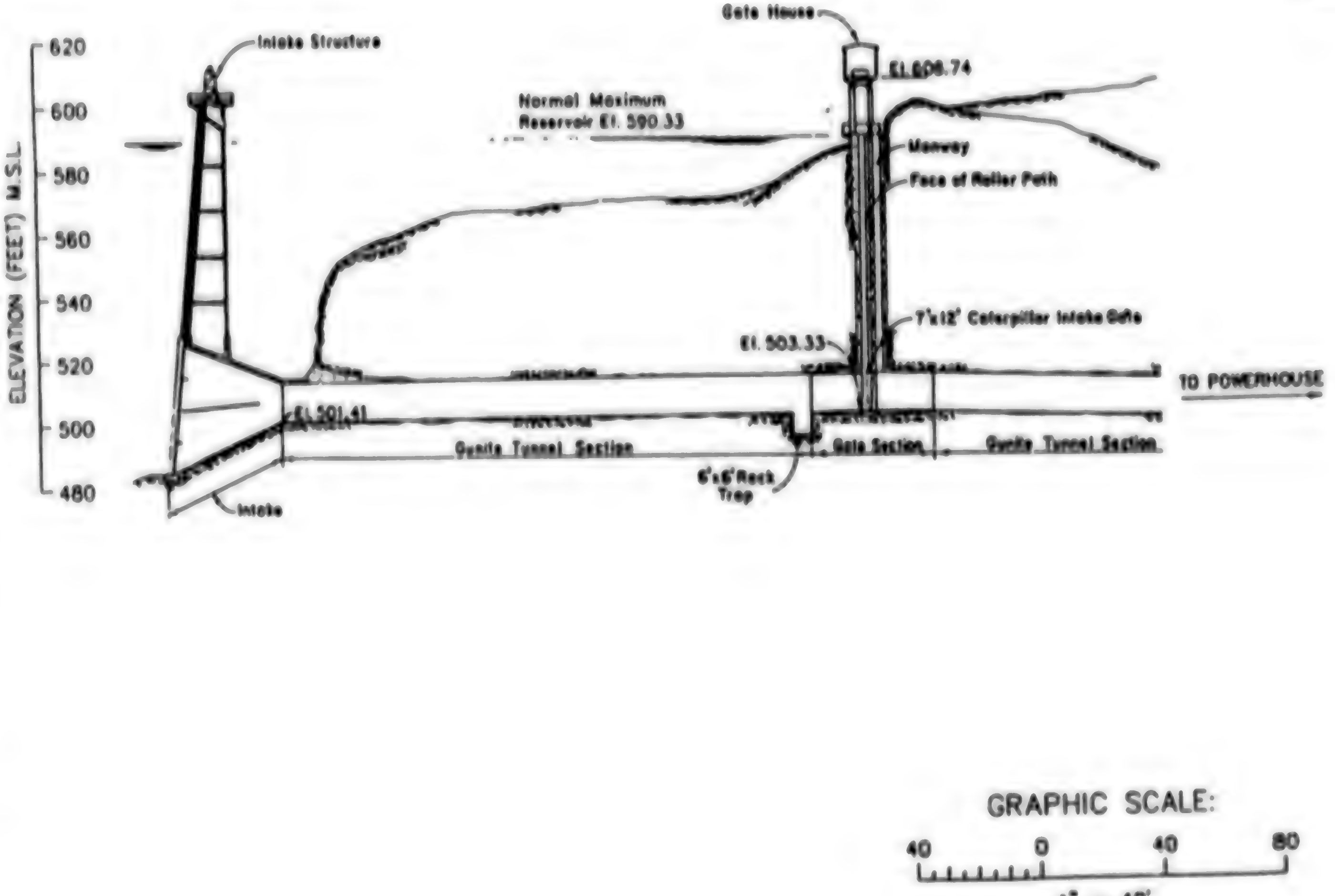
AND ASSOCIATES

NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929; PROJECT VERTICAL DATUM IS 19.67 FEET HIGHER THAN M.S.L.
2. SECOND-STAGE DIVERSION WILL ALLOW DRAWDOWN OF LAKE MILLS TO ABOUT EL 515, M.S.L.



87

FIGURE NO.
F19

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
FIXED CONE VALVE - 2nd STAGE DIVERSION CONTROL

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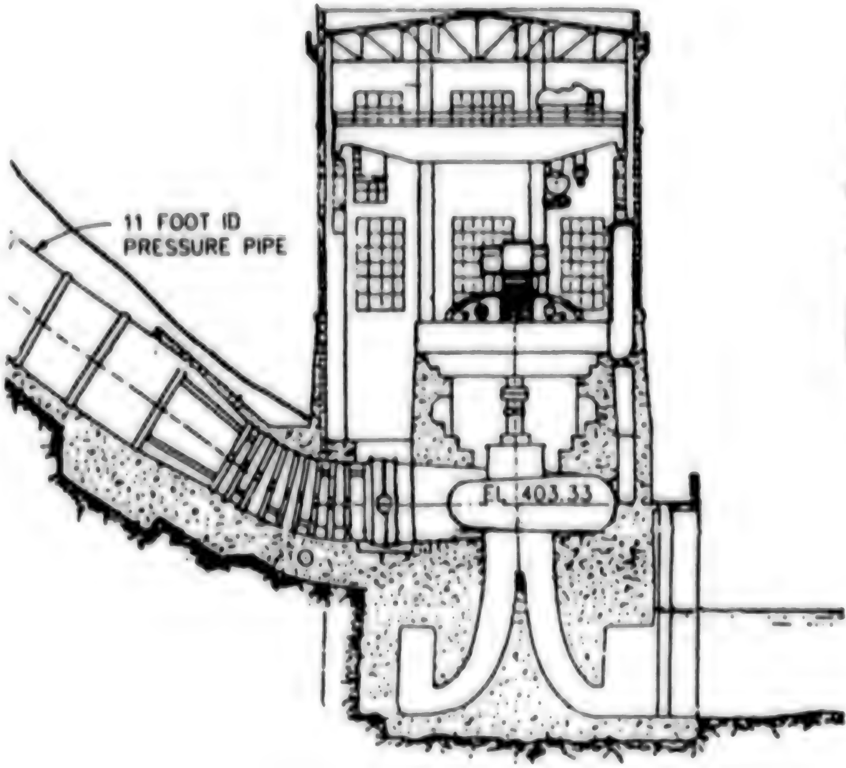
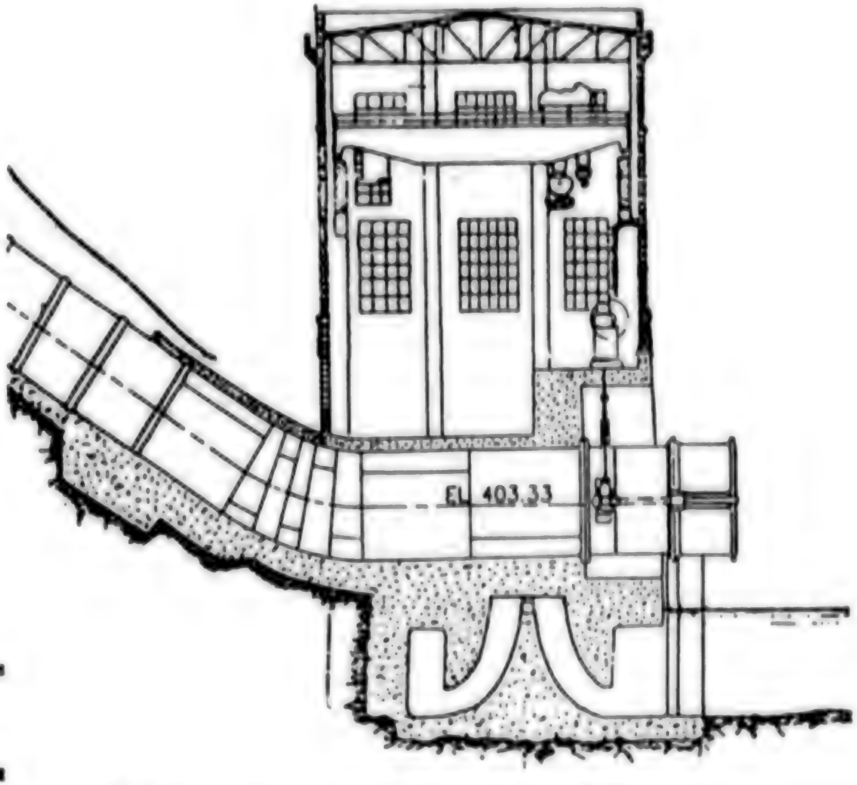
AND ASSOCIATES

NOTES:

1. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929; PROJECT VERTICAL DATUM IS 19.67 FEET HIGHER THAN M.S.L.
2. SECOND-STAGE DIVERSION WILL ALLOW DRAWDOWN OF LAKE MILLS TO ABOUT EL. 515, M.S.L.



EXISTING ARRANGEMENT



ELEVEN-FOOT DIAMETER FIXED-CONE VALVE
WITH ELECTRIC MOTOR OPERATOR

PROPOSED ALTERNATIVE

FIGURE NO

F20

ELWHA RIVER RESTORATION
MAXIMUM DISCHARGE THROUGH POWER CONDUIT
WITH 132 INCH DIAMETER FIXED CONE VALVE

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AND ASSOCIATES

GLINES CANYON HYDROELECTRIC PROJECT
MAX DISCHARGE THROUGH POWER CONDUIT

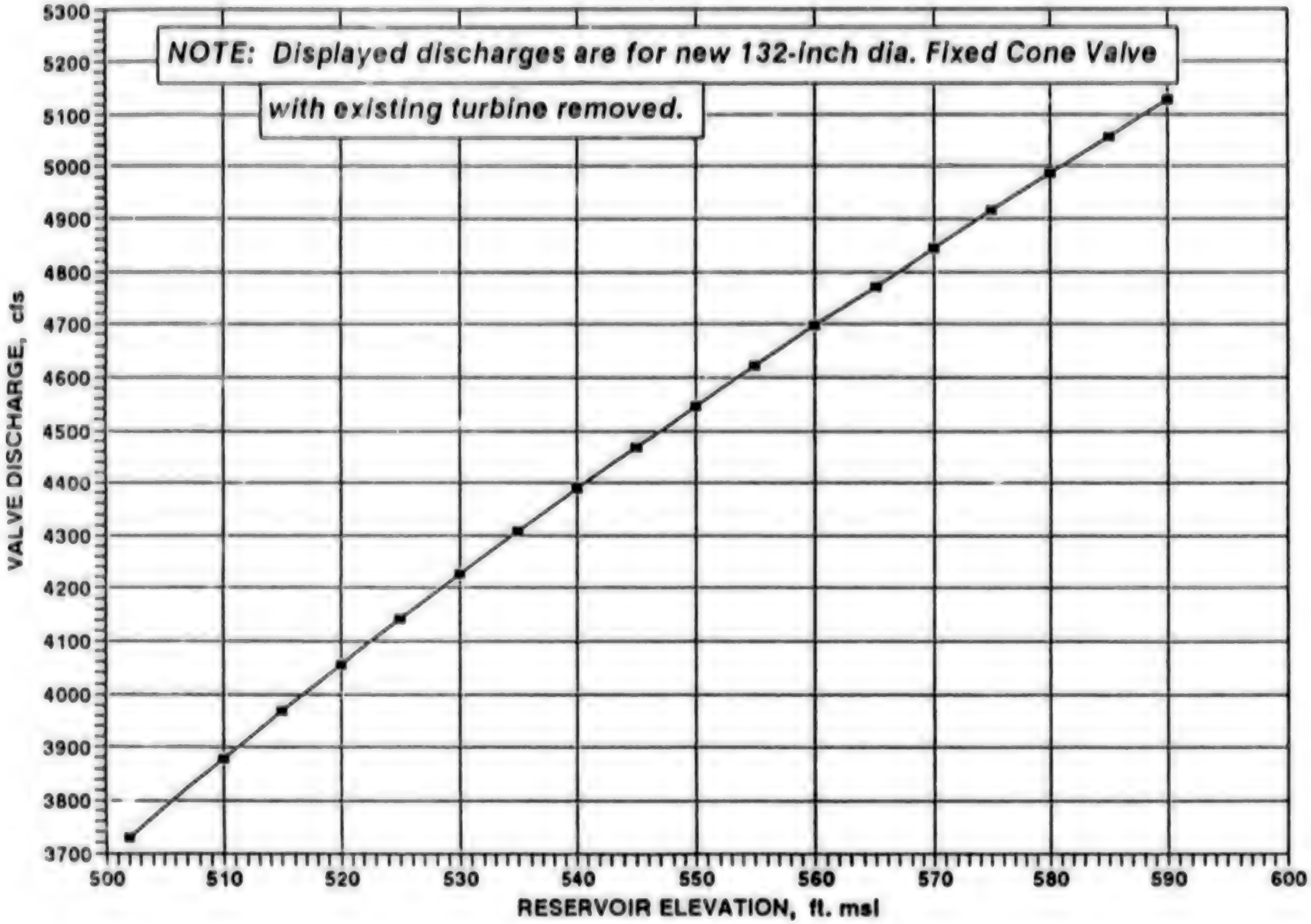

FIGURE NO.
F21

ELWHA RIVER RESTORATION
MAXIMUM DISCHARGE THROUGH POWER CONDUIT WITH TURBINE RUNNER REMOVED

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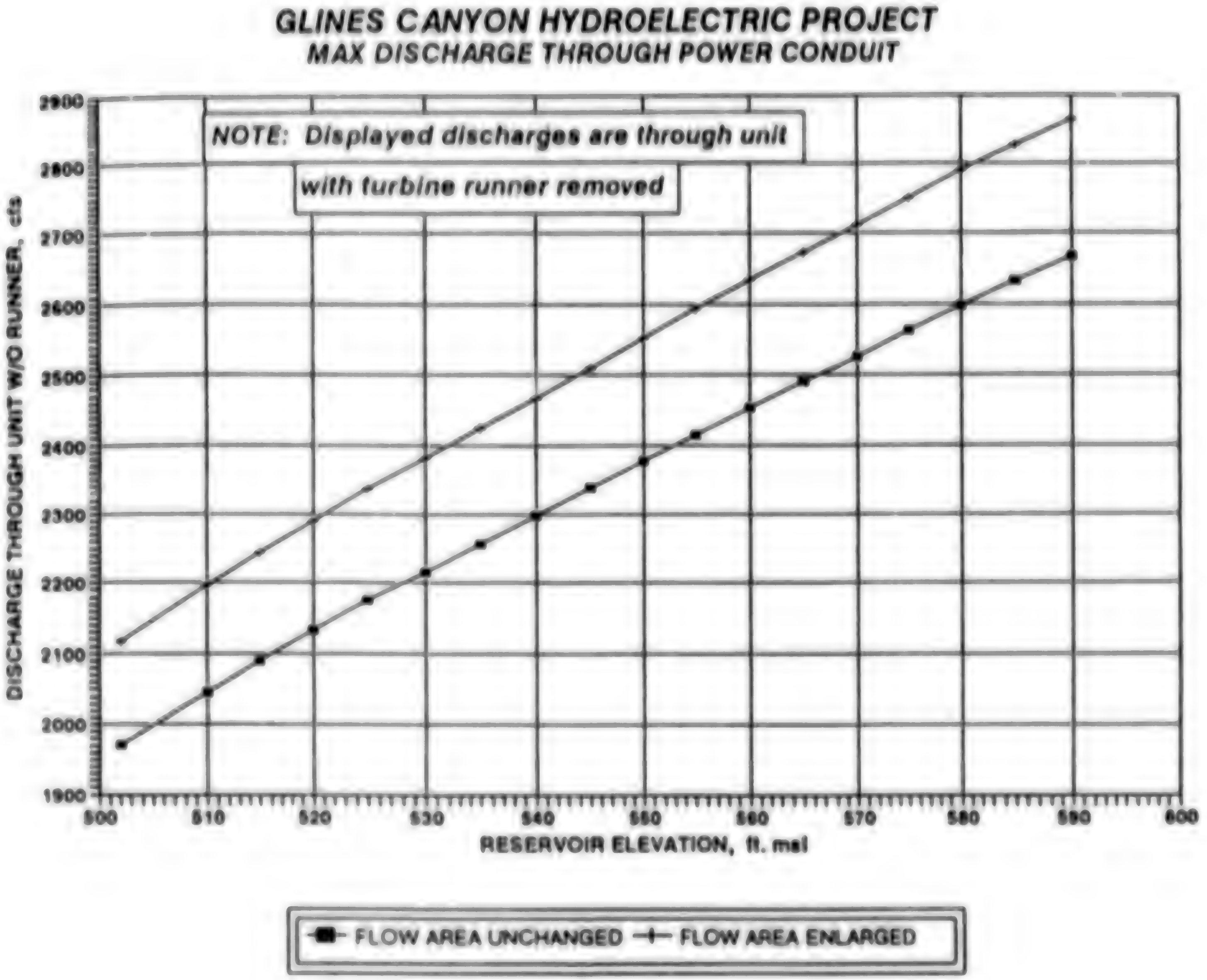
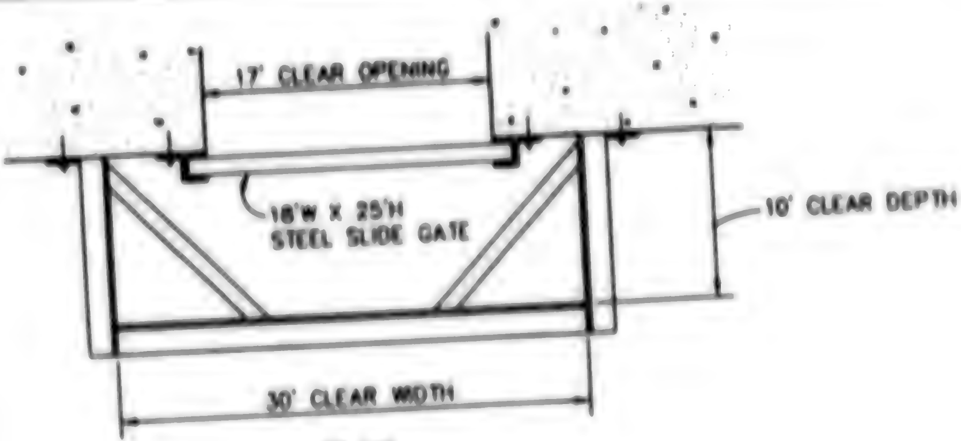
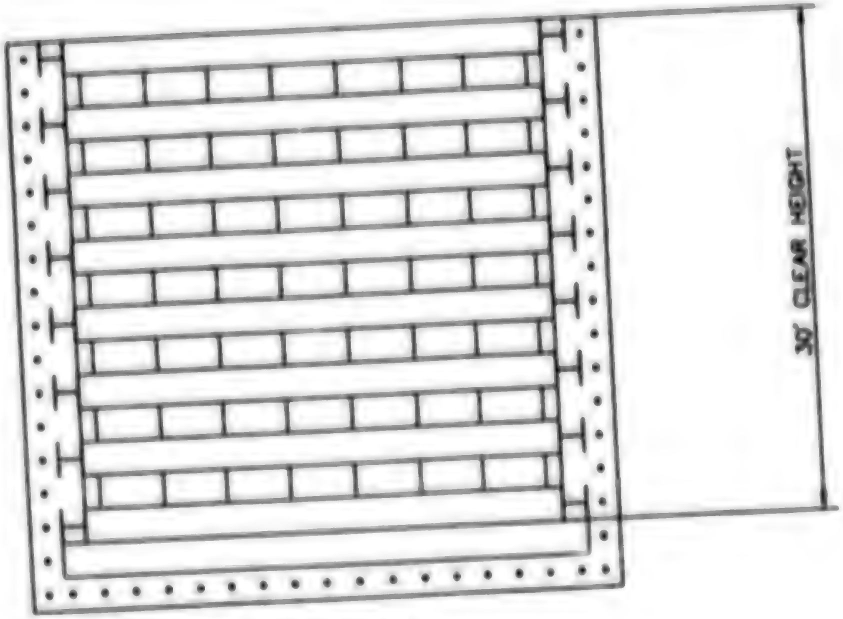
R.W. BECK



90



PLAN



ELEVATION

BULKHEAD

NOTES:

1. BULKHEAD COMPRISED OF INNER STEEL SKIN PLATES WITH STRUCTURAL BEAMS FOR RIGIDITY AND SUPPORT.
2. BULKHEAD SECURED TO UPSTREAM FACE OF DAM USING EXPANSION BOLTS OR OTHER SUITABLE UNDER WATER BOLTED CONSTRUCTION.
3. BULKHEAD PROVIDED WITH CONCRETE BALLAST OR SEALED COMPARTMENTS THAT CAN BE FILLED/DRAINED OF WATER TO PROVIDE NEUTRAL BUOYANCY AS REQUIRED FOR EASE OF HANDLING.

GRAPHIC SCALE:

1/8" = 1'-0"

FIGURE NO.

F22

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
TEMPORARY BULKHEAD FOR SLIDE GATE INSTALLATION

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R.W. BECK

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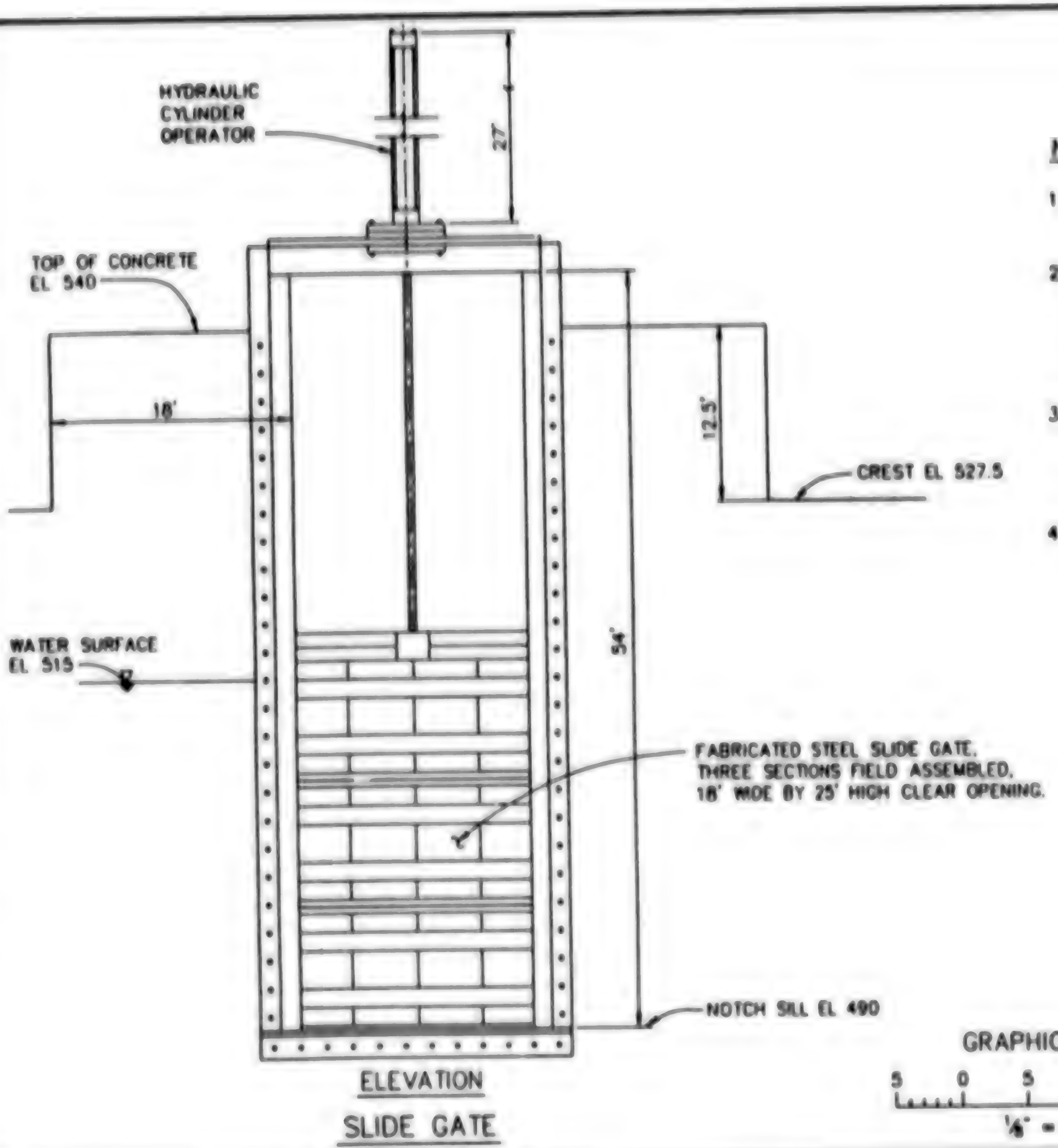
FIGURE NO.
F23

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
SLIDE GATE FOR DIVERSION CONTROL THROUGH NOTCH

SUMMIT TECHNOLOGY
R.W. BECK AND ASSOCIATES


HYDRAULIC CYLINDER OPERATOR
27'
TOP OF CONCRETE EL 540
18'
12.5'
CREST EL 527.5
54'
WATER SURFACE EL 515
FABRICATED STEEL SLIDE GATE, THREE SECTIONS FIELD ASSEMBLED, 18' WIDE BY 25' HIGH CLEAR OPENING.
NOTCH SILL EL 490

ELEVATION

SLIDE GATE

NOTES:

1. SLIDE GATE DESIGNED TO REGULATE RELEASES TO CONTROL DRAWDOWN RATE.
2. SLIDE GATE FRAME COMPRISED OF STEEL CHANNEL SECTIONS SECURED TO UPSTREAM FACE OF DAM USING EXPANSION BOLTS OR OTHER SUITABLE BOLTED CONSTRUCTION.
3. LAYOUT SHOWN IS FOR THE INITIAL NOTCH BYPASS. EIGHT ADDITIONAL NOTCHES ARE PLANNED FOR DRAWING DOWN LAKE MILLS TO RIVER LEVEL.
4. ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL (M.S.L.) BASED ON NVGD, 1929.

GRAPHIC SCALE:
5 0 5 10 15 20
1/8" = 1'-0"

FIGURE NO.

F24

ELWHA RIVER RESTORATION
GLINES CANYON DAM REMOVAL
CONSTRUCTION SCHEDULE

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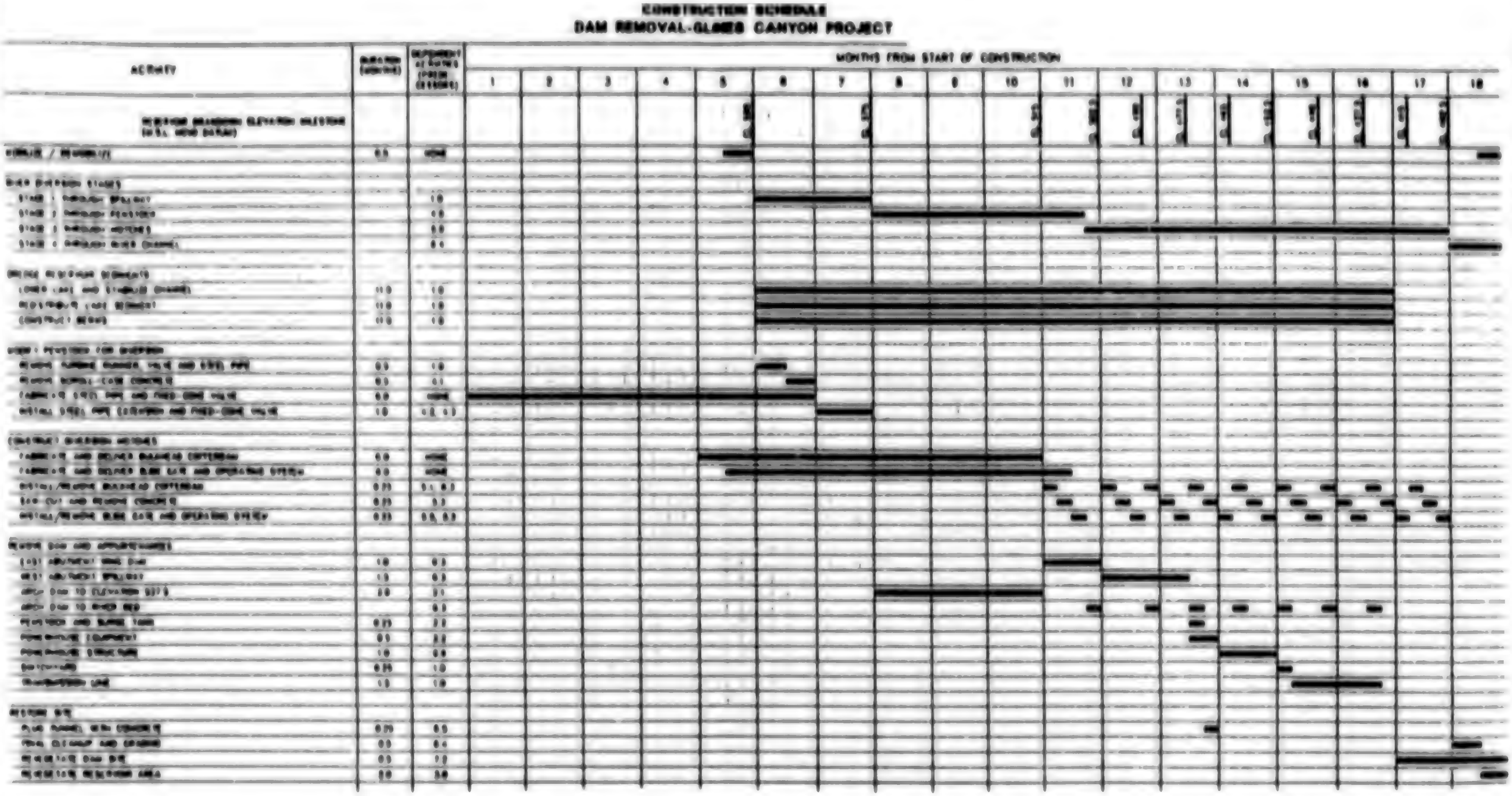
CONSTRUCTION SCHEDULE
DAM REMOVAL-GLINES CANYON PROJECT



93

FIGURE NO.
F25

ELWHA RIVER RESTORATION
ELWHA DAM REMOVAL
CONSTRUCTION SCHEDULE

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R.W. BECK AND ASSOCIATES

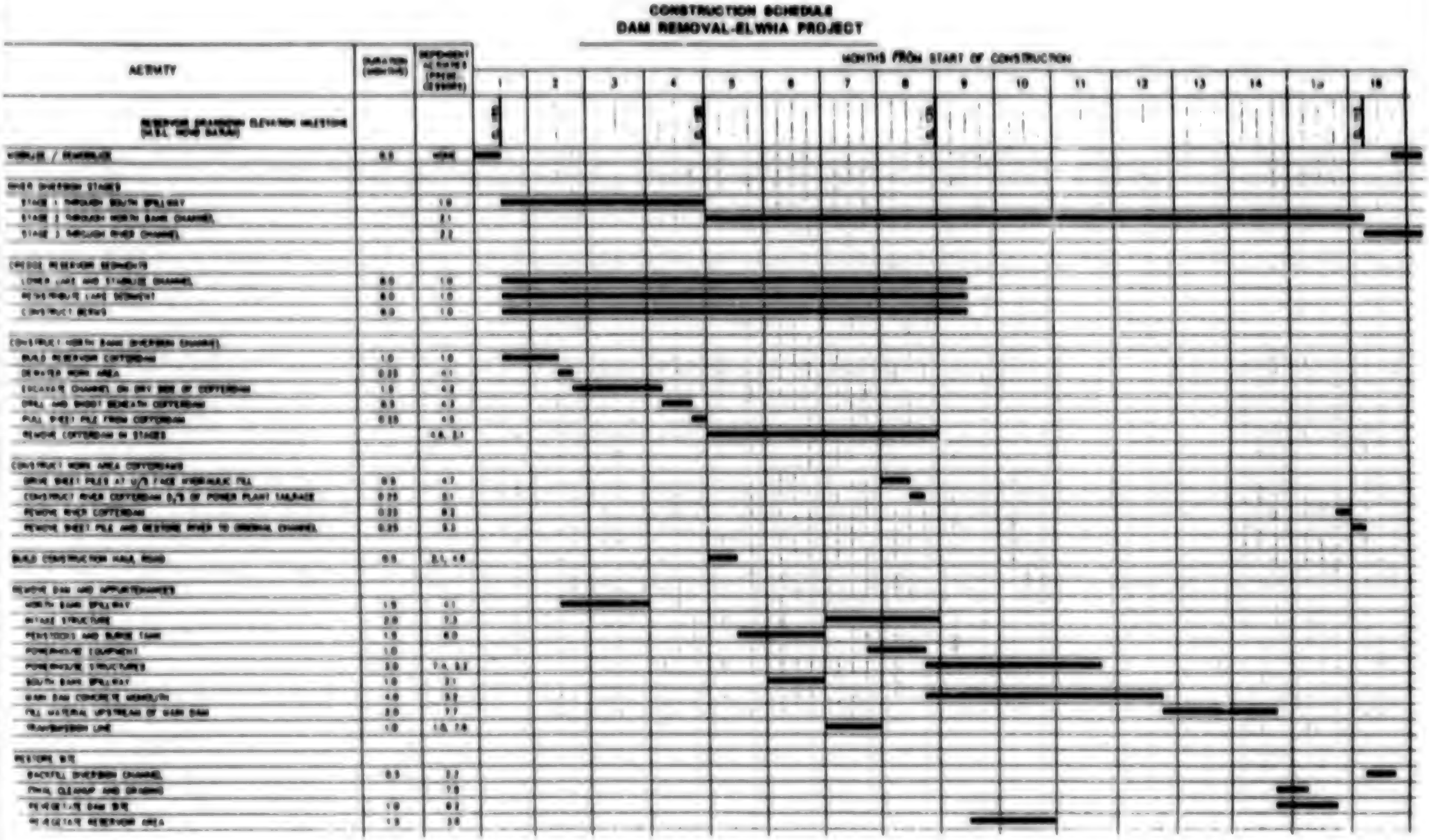

FIGURE NO
F26

ELWHA RIVER RESTORATION
APPROACH ALTERNATIVE MATRIX
FOR SEDIMENT MANAGEMENT

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		Location of Trapped Material	Lake Mills							Lake Aldwell						$Mill.	Years	mg/l
		Type of Material	Coarse				Fine			Coarse			Fine					
General Approach ↓	Scenario ↓	*Final Location of Material* →	Saltwater	Upland Disposal	Relocate to Lake Aldwell	Retain in Lakes	Saltwater	Upland Disposal	Retained in Lakes	Saltwater	Upland Disposal	Retained in Lakes	Saltwater	Upland Disposal	Retained in Lakes	Construction Cost	Construction Time	Average River SSC Levels
Removal	1	FERC Licensee Approach-Mech.[1]		■				■			■			■		97.3	8	[2]
	2	FERC Licensee Approach-Dredge[1]	■				■			■			■			193.7	8	[3]
Erosion	3	Complete Washout	■				■			■			■			94.7	10-20	1000
	4	Erode to Lake Aldwell			■		■					■	■			168.9	6	1500
Retention	5	Retain All Material in Lake Area				■			■			■			■	62.9	4	[3]
	6	Erode Delta - Retain in Lake				■			■			■			■	55.2	4	800
Combination	7	Erode Delta - Washout Silt & Clay				■	■					■	■			50.2	3	1500
	8	Remove & Washout		■			■				■		■			97.1	6	1500
	9	Remove & Washout	■				■			■			■			192.9	6	1500

[1] Hosey Report, Dec. 1, 1989

[2] Projected to be approximately 800 mg/l during lake drawdown.

[3] Similar projects have achieved construction within 25 mg/l above background.

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ELWHA RIVER RESTORATION
LAKE ALDWELL
AVAILABLE STORAGE VOLUMES

FIGURE NO. F27

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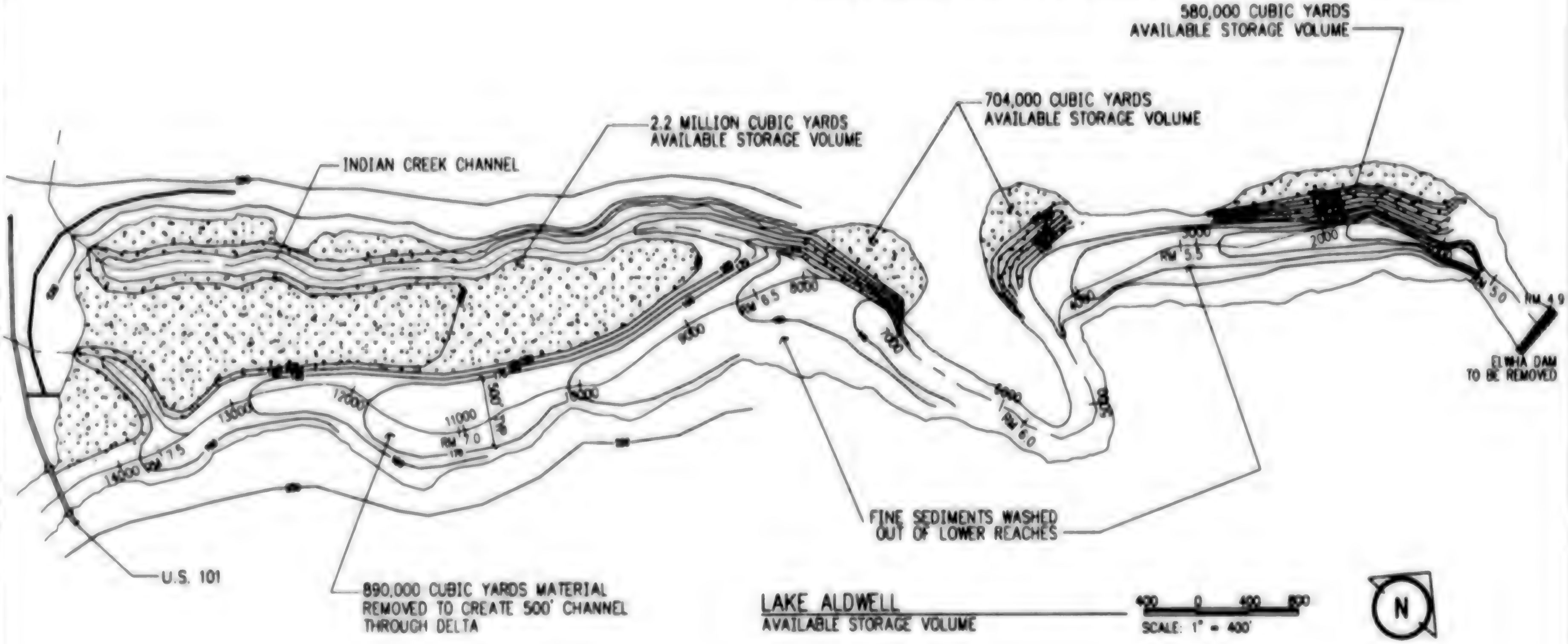
LEGEND

8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
	EXISTING CONTOUR
590	NEW CONSTRUCTION CONTOUR
580	WATER SURFACE ELEVATION CONTOUR
▨	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
⁚	LANDSCAPING

MATERIAL VOLUMES:

AVAILABLE STORAGE VOLUME BEYOND 500' CHANNEL	3.5 MILLION CUBIC YARDS
COURSE MATERIAL REMOVED FROM CHANNEL TO BE STORED ON CHANNEL BANKS.	774,300 CUBIC YARDS
ADDITIONAL VOLUME AVAILABLE FOR STORAGE OF COURSE MATERIAL FROM LAKE MILLS.	2.7 MILLION CUBIC YARDS
VOLUME OF COURSE MATERIAL IN LAKE MILLS DELTA.	6.3 MILLION CUBIC YARDS



LAKE ALDWELL
AVAILABLE STORAGE VOLUME

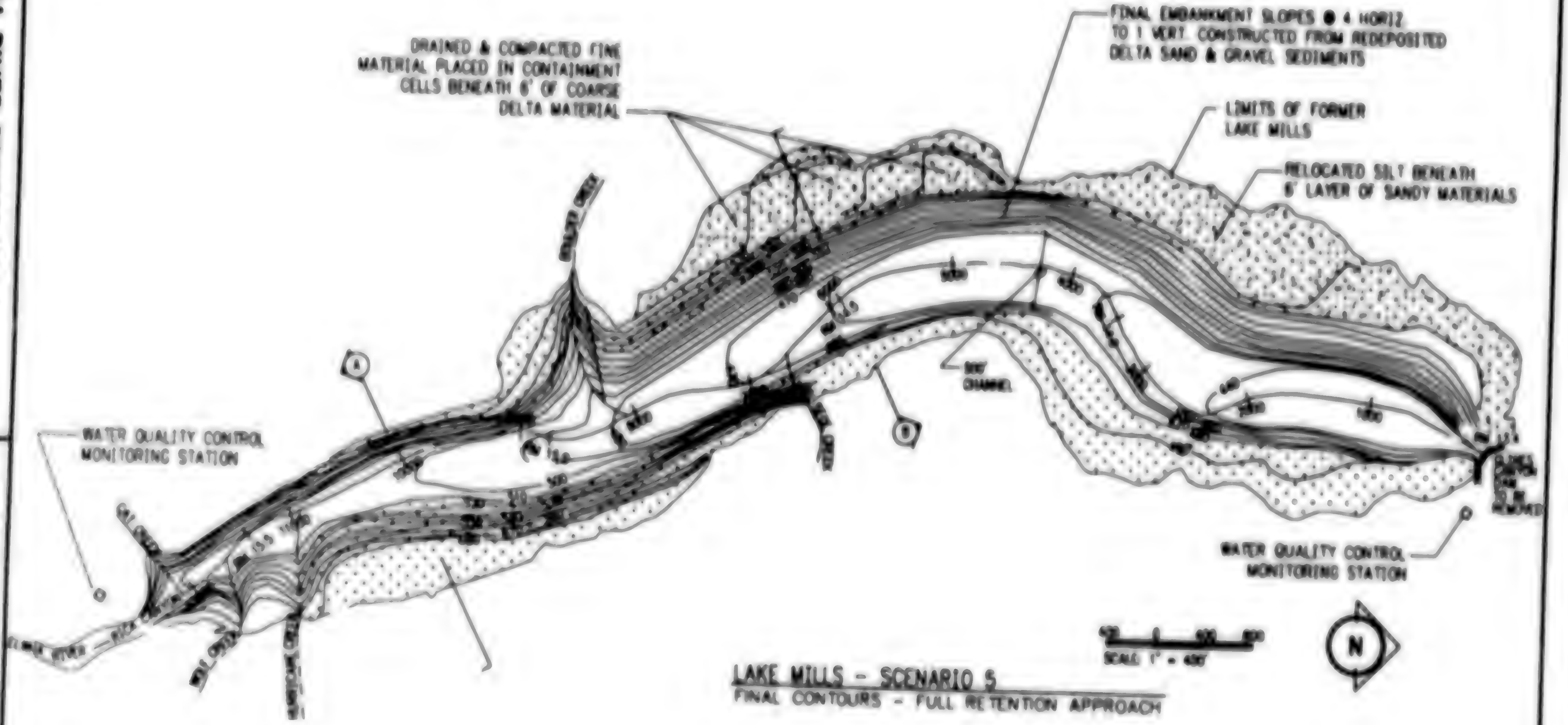
SCALE: 1" = 400'

LEGEND

—800—	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
— —	EXISTING CONTOUR
—590—	NEW CONSTRUCTION CONTOUR
—590—	WATER SURFACE ELEVATION CONTOUR
▨	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
☐	LANDSCAPING

RELOCATED MATERIAL VOLUMES:

COARSE MATERIAL	4.0 MILLION CUBIC YARDS
FINE MATERIAL	2.2 MILLION CUBIC YARDS


DRAINED & COMPACTED FINE MATERIAL PLACED IN CONTAINMENT CELLS BENEATH 6' OF COARSE DELTA MATERIAL
FINAL EMBANKMENT SLOPES @ 4 HORIZ TO 1 VERT. CONSTRUCTED FROM REDEPOSITED DELTA SAND & GRAVEL SEDIMENTS
LIMITS OF FORMER LAKE MILLS
RELOCATED SILT BENEATH 6' LAYER OF SANDY MATERIALS
WATER QUALITY CONTROL MONITORING STATION
WATER QUALITY CONTROL MONITORING STATION
CHANNEL
A
B
N
SCALE 1" = 400'
ELWHA RIVER

LAKE MILLS - SCENARIO 5
FINAL CONTOURS - FULL RETENTION APPROACH

F28

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 5
FINAL CONTOURS - FULL RETENTION APPROACH

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FIGURE NO.

F29

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 6
FINAL CONTOURS

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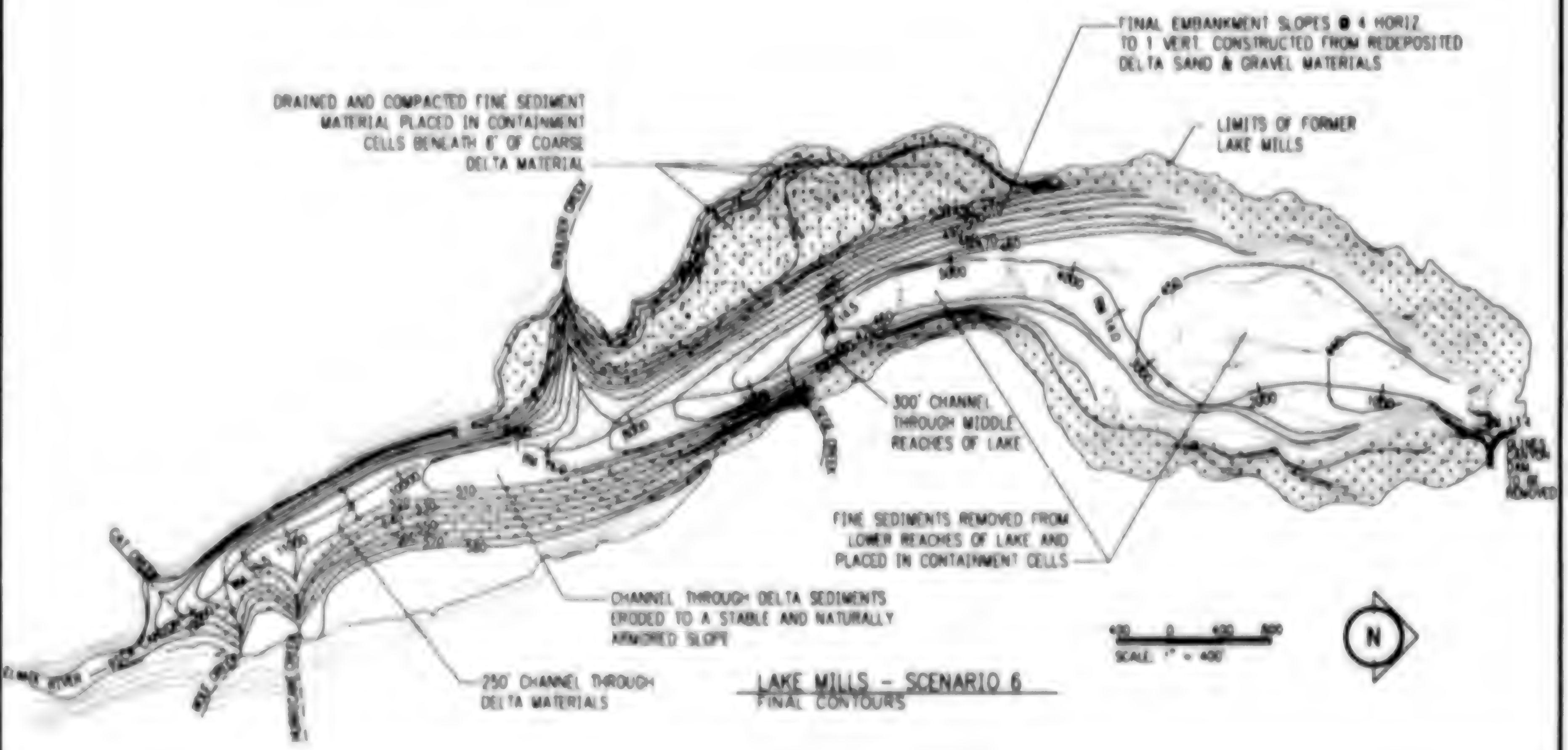
LEGEND

5000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
580	EXISTING CONTOUR
580	NEW CONSTRUCTION CONTOUR
580	WATER SURFACE ELEVATION CONTOUR
▦	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
⬚	LANDSCAPING

RELOCATED MATERIAL VOLUMES

COARSE SEDIMENT REMOVED FROM DELTA FOR 250' CHANNEL	3.3 MILLION CUBIC YARDS
FINE LAKEBED MATERIAL TO BE RELOCATED	3.1 MILLION CUBIC YARDS


FINAL EMBANKMENT SLOPES @ 4 HORIZ. TO 1 VERT. CONSTRUCTED FROM REDEPOSITED DELTA SAND & GRAVEL MATERIALS
DRAINED AND COMPACTED FINE SEDIMENT MATERIAL PLACED IN CONTAINMENT CELLS BENEATH 6' OF COARSE DELTA MATERIAL
LIMITS OF FORMER LAKE MILLS
300' CHANNEL THROUGH MIDDLE REACHES OF LAKE
FINE SEDIMENTS REMOVED FROM LOWER REACHES OF LAKE AND PLACED IN CONTAINMENT CELLS
CHANNEL THROUGH DELTA SEDIMENTS ERODED TO A STABLE AND NATURALLY ARMORED SLOPE
250' CHANNEL THROUGH DELTA MATERIALS
GLINES CANYON DAM TO BE REMOVED
ELWHA RIVER
400 0 400 800
SCALE: 1" = 400'
N
5000
4000
3000
1000
300
310
320
330
370

LAKE MILLS - SCENARIO 6
FINAL CONTOURS

FIGURE NO.

F30

ELWHA RIVER RESTORATION
LAKE ALDWELL - SCENARIO 5
SECTION THROUGH LAKE ALDWELL

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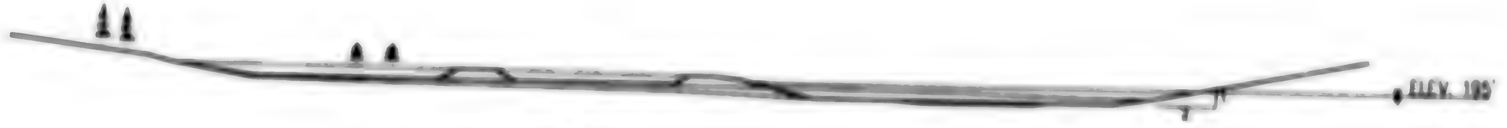
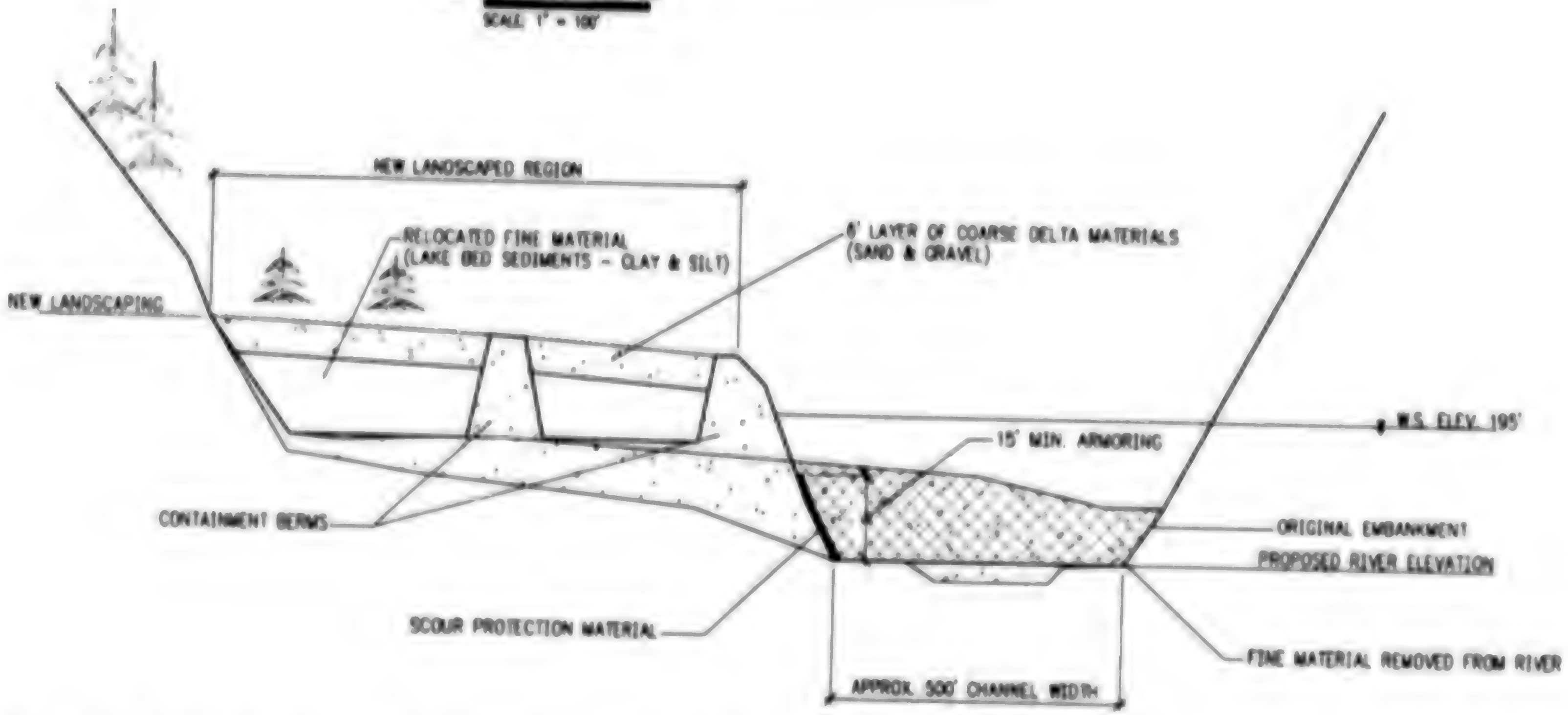


(B) SECTION AT MID LAKE
100 0 100 200
SCALE 1" = 100'


NEW LANDSCAPED REGION
RELOCATED FINE MATERIAL (LAKE BED SEDIMENTS - CLAY & SILT)
6' LAYER OF COARSE DELTA MATERIALS (SAND & GRAVEL)
NEW LANDSCAPING
W.S. ELEV. 195'
15' MIN. ARMORING
CONTAINMENT BERMS
ORIGINAL EMBANKMENT
PROPOSED RIVER ELEVATION
SCOUR PROTECTION MATERIAL
FINE MATERIAL REMOVED FROM RIVER
APPROX. 500' CHANNEL WIDTH

(B) TYPICAL SECTION THROUGH RECONSTRUCTED RIVER CHANNEL - EXAGGERATED VERTICAL SCALE
100 0 100 200 10 0 10 20
HORIZ. SCALE 1" = 100' VERT. SCALE 1" = 10'

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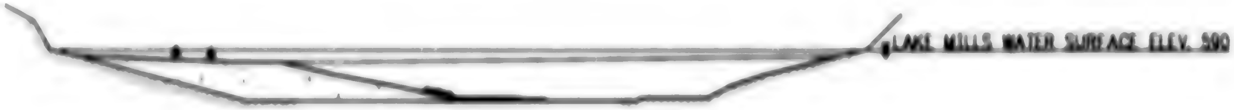
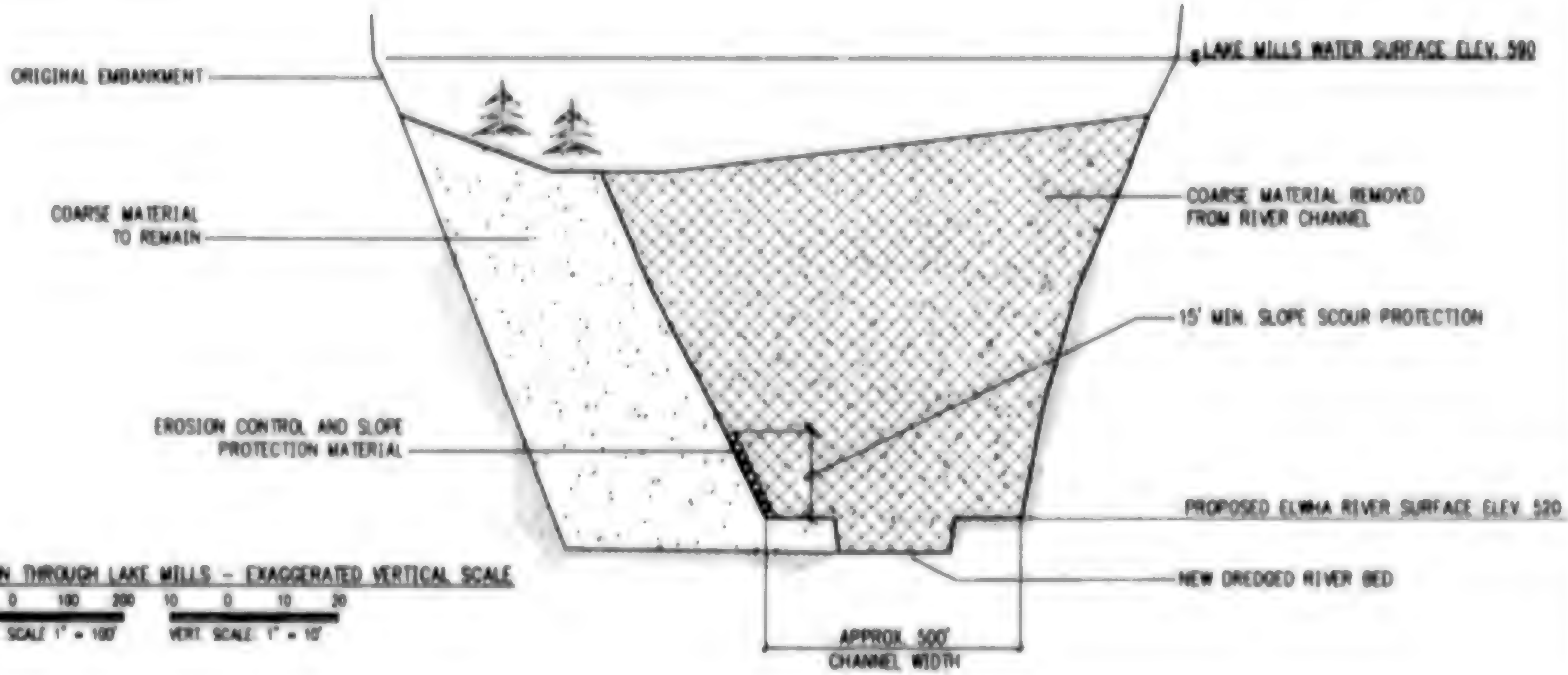
ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 5
SECTION THROUGH LAKE MILLS

FIGURE NO.
F31

SUMMIT TECHNOLOGY



(A) SECTION THROUGH LAKE MILLS
100 0 100 200
SCALE 1" = 100'


LAKE MILLS WATER SURFACE ELEV. 590
ORIGINAL EMBANKMENT
COARSE MATERIAL REMOVED FROM RIVER CHANNEL
COARSE MATERIAL TO REMAIN
15' MIN. SLOPE SCOUR PROTECTION
EROSION CONTROL AND SLOPE PROTECTION MATERIAL
PROPOSED ELWHA RIVER SURFACE ELEV. 520
NEW DREDGED RIVER BED
APPROX. 500' CHANNEL WIDTH

(A) SECTION THROUGH LAKE MILLS - EXAGGERATED VERTICAL SCALE
100 0 100 200
HORIZ. SCALE 1" = 100'
10 0 10 20
VERT. SCALE 1" = 10'

100

FIGURE NO.

F32

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 7
FINAL CONTOURS

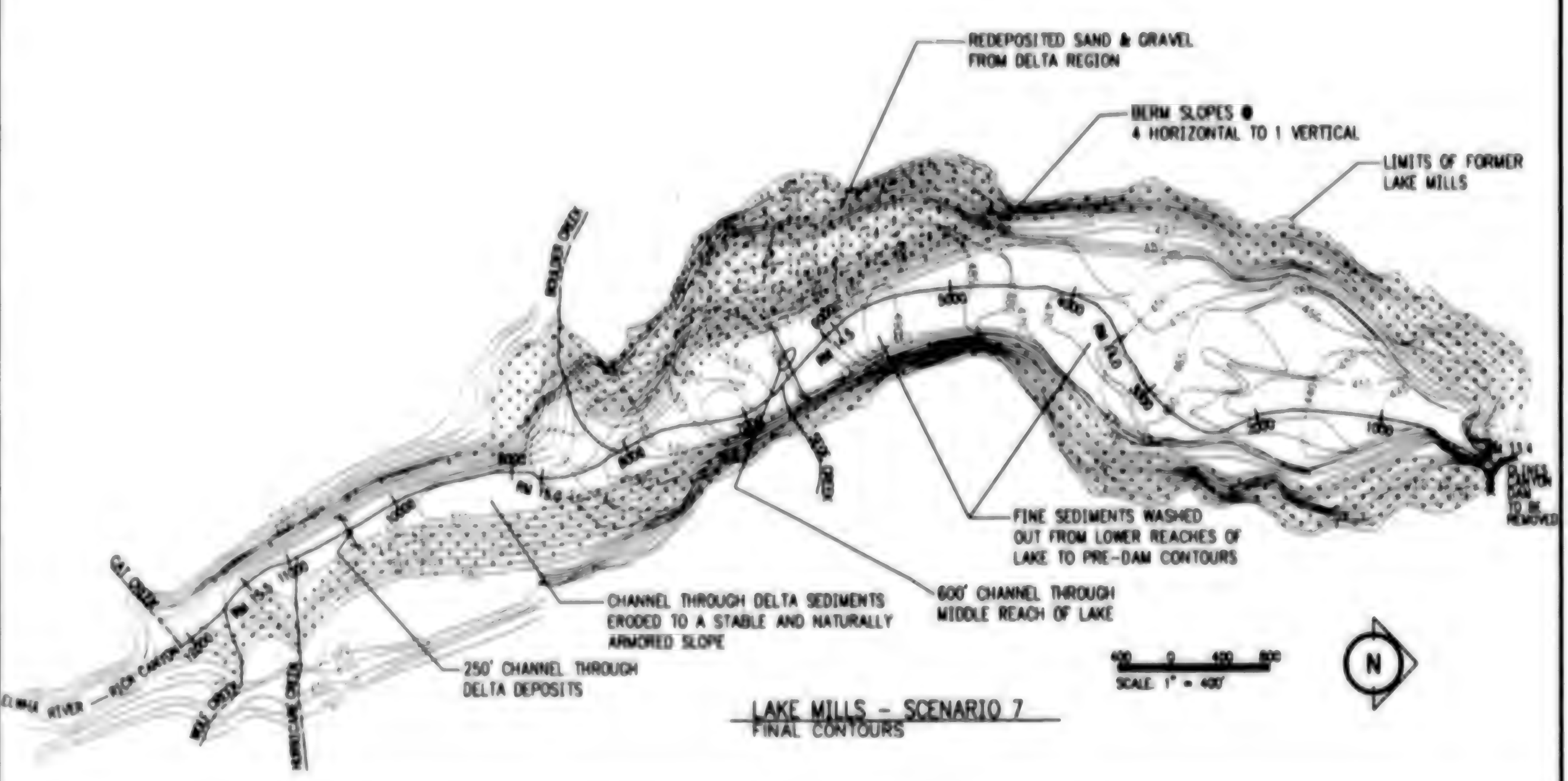
SUMMIT TECHNOLOGY

LEGEND

8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
	EXISTING CONTOUR
590	NEW CONSTRUCTION CONTOUR
590	WATER SURFACE ELEVATION CONTOUR
▨	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
▨	LANDSCAPING

MATERIAL VOLUMES:

VOLUME OF COARSE SEDIMENT ROMOVED FROM DELTA FOR 250' CHANNEL	3.34 MILLION CUBIC YARDS
VOLUME OF FINE LAKEBED SEDIMENTS TO BE STORED	2.5 MILLION CUBIC YARDS (25% COMPACTION ASSUMED)


REDEPOSITED SAND & GRAVEL FROM DELTA REGION
BERM SLOPES @ 4 HORIZONTAL TO 1 VERTICAL
LIMITS OF FORMER LAKE MILLS
FINE SEDIMENTS WASHED OUT FROM LOWER REACHES OF LAKE TO PRE-DAM CONTOURS
CHANNEL THROUGH DELTA SEDIMENTS ERODED TO A STABLE AND NATURALLY ARMORED SLOPE
600' CHANNEL THROUGH MIDDLE REACH OF LAKE
250' CHANNEL THROUGH DELTA DEPOSITS
GLINES CANYON DAM TO BE REMOVED
BOULDER CREEK
CAT CREEK
ELWHA RIVER
RICA CANYON
WILLIAMSON CREEK
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
400 0 400 800
SCALE: 1" = 400'
N

LAKE MILLS - SCENARIO 7
FINAL CONTOURS

101

FIGURE NO.

F33

ELWHA RIVER RESTORATION
LAKE ALDWELL
EXISTING CONTOURS AND PROFILE

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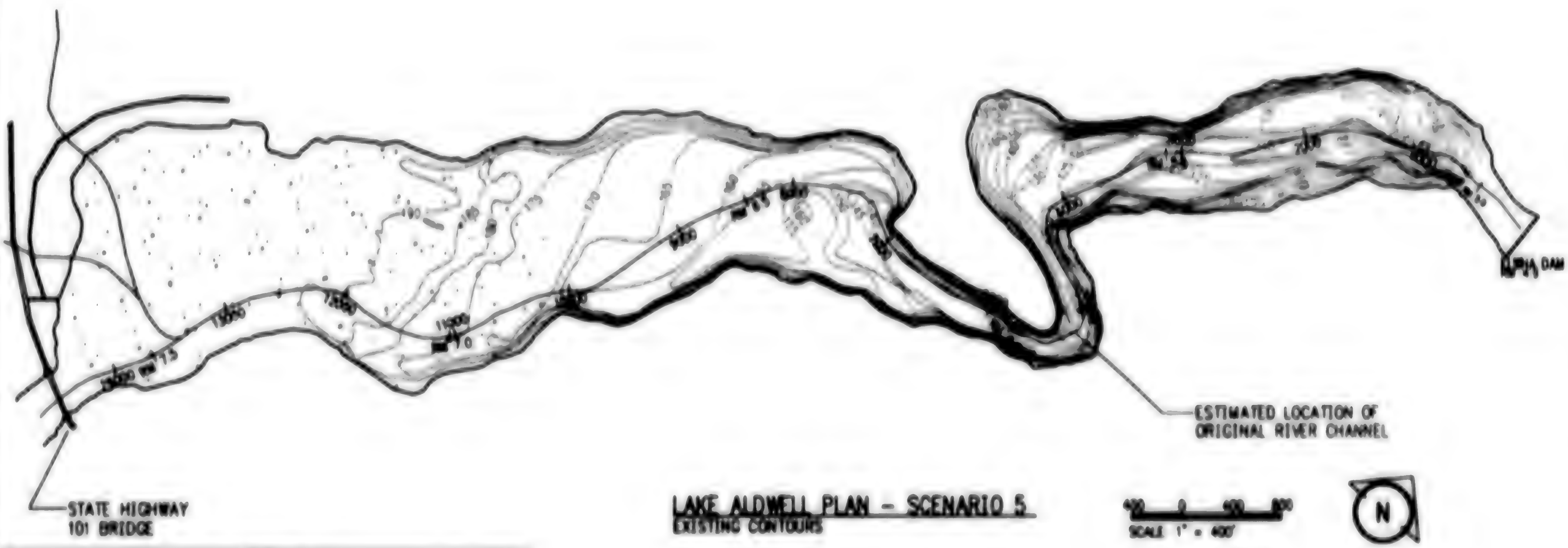
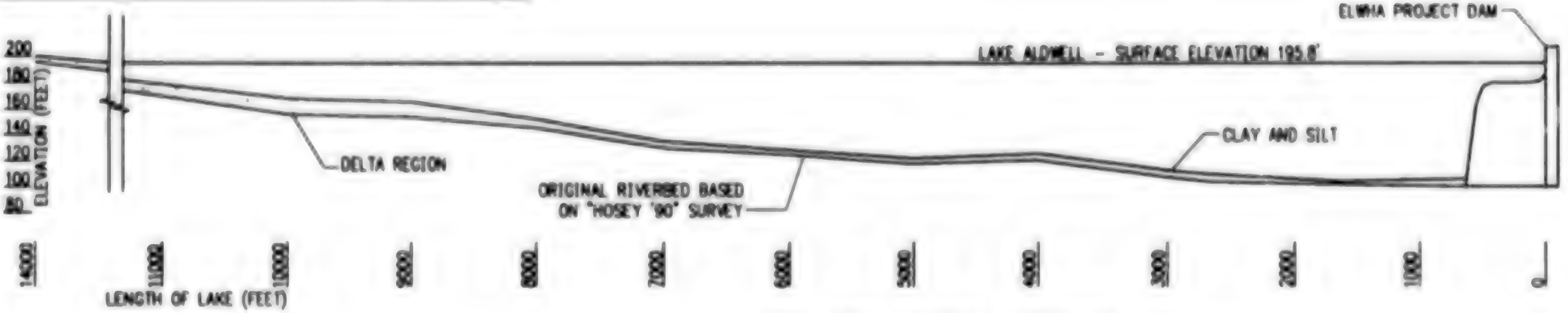


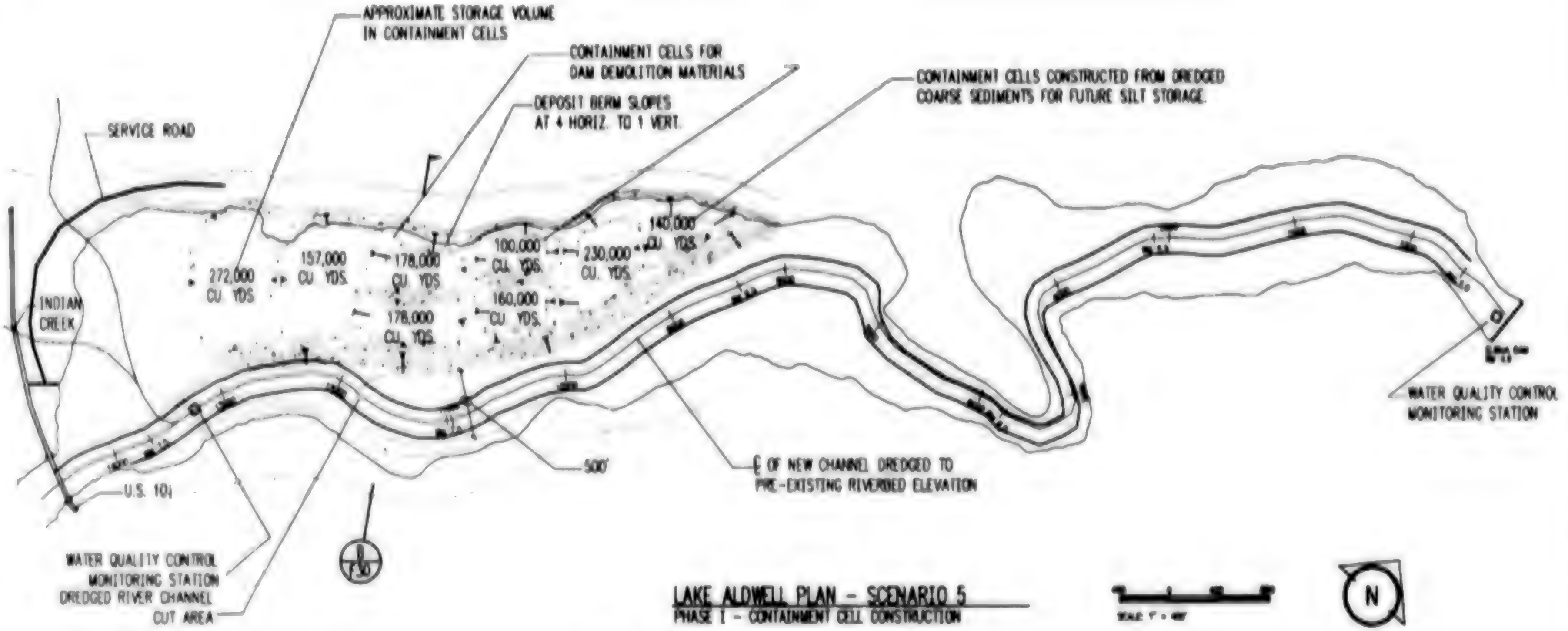
LAKE ALDWELL PLAN - SCENARIO 5
EXISTING CONTOURS

LEGEND

8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
100	EXISTING CONTOUR
590	NEW CONSTRUCTION CONTOUR
590	WATER SURFACE ELEVATION CONTOUR
▨	DELTA SEDIMENT (SAND & GRAVEL)
☐	FINE SEDIMENT (CLAY & SILT)



LAKE ALDWELL PROFILE - SCENARIO 5

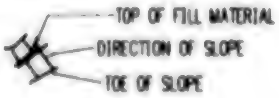

APPROXIMATE STORAGE VOLUME IN CONTAINMENT CELLS
CONTAINMENT CELLS FOR DAM DEMOLITION MATERIALS
DEPOSIT BERM SLOPES AT 4 HORIZ. TO 1 VERT.
CONTAINMENT CELLS CONSTRUCTED FROM DREDGED COARSE SEDIMENTS FOR FUTURE SILT STORAGE.
SERVICE ROAD
INDIAN CREEK
272,000 CU YDS.
157,000 CU YDS.
178,000 CU YDS.
178,000 CU YDS.
100,000 CU YDS.
160,000 CU YDS.
230,000 CU YDS.
140,000 CU YDS.
500'
℄ OF NEW CHANNEL DREDGED TO PRE-EXISTING RIVERBED ELEVATION
WATER QUALITY CONTROL MONITORING STATION
U.S. 101
WATER QUALITY CONTROL MONITORING STATION
DREDGED RIVER CHANNEL CUT AREA
B F30
N

LAKE ALDWELL PLAN - SCENARIO 5

PHASE I - CONTAINMENT CELL CONSTRUCTION

LEGEND	
—8000—	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
	EXISTING CONTOUR
—590—	NEW CONSTRUCTION CONTOUR
—590—	WATER SURFACE ELEVATION CONTOUR
▭	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
▭	LANDSCAPING

SEDIMENT BERM CONSTRUCTION



PHASE I - ACTIVITIES

FINAL RIVER CHANNEL CONTOURS DREDGED THROUGH UPPER REACHES OF LAKE. CHANNEL BANKS STAND AT APPROXIMATELY 4:1 SLOPES.

DREDGED COARSE SEDIMENTS REDEPOSITED ALONG CHANNEL BANKS TO FORM BERMS. BERMS AND CANYON WALLS CREATE CONTAINMENT CELLS TO BE USED FOR DEWATERING SILT AND CLAY DREDGED FROM LOWER REACHES OF LAKE DURING PHASE II.

PHASE I - MATERIAL VOLUMES

DREDGED COARSE SEDIMENTS	0.85 MIL. CUBIC YARDS SAND AND GRAVEL

ELWHA RIVER RESTORATION
LAKE ALDWELL - SCENARIO 5
PHASE I - CONTAINMENT CELL CONSTRUCTION

FIGURE NO.
F34

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FIGURE NO.
F35

ELWHA RIVER RESTORATION
LAKE ALDWELL - SCENARIO 5
PHASE II - FINAL CONTOURS

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LEGEND

8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
	EXISTING CONTOUR
180	NEW CONSTRUCTION CONTOUR
180	WATER SURFACE ELEVATION CONTOUR
☐	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)
☐	LANDSCAPING

PHASE II - COMPLETED PROCEDURES

FINAL RIVER CHANNEL CONTOURS DREDGED THROUGH LOWER REACHES OF LAKE

DREDGED FINE SEDIMENTS (CLAY AND SILT) REDEPOSITED INTO CONTAINMENT CELLS FOR DRAINING AND STABILIZATION

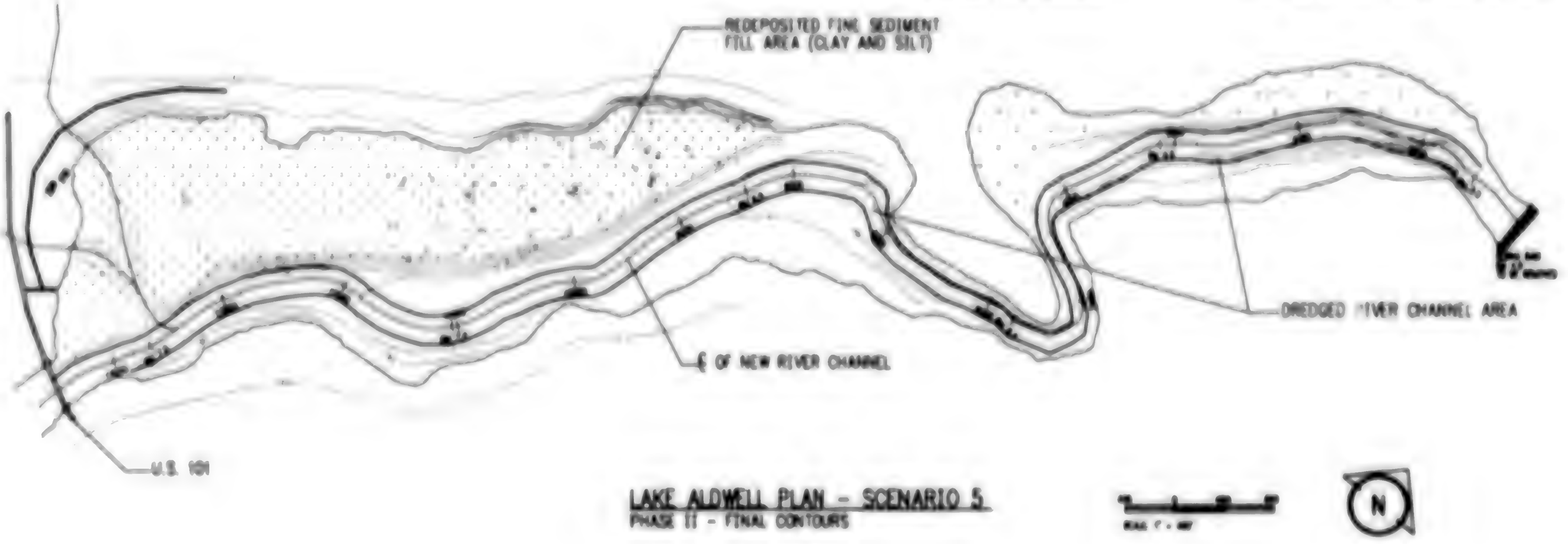
FINAL GRADING OF REDEPOSITED SEDIMENTS

PLACE EROSIOIN CONTROL AND SLOPE PROTECTION MATERIAL

LANDSCAPE AND REVEGETATION

PHASE II - MATERIAL VOLUMES

DREDGED FINE SEDIMENTS	0.91 MIL. CUBIC YARDS SILT AND CLAY


REDEPOSITED FINE SEDIMENT FILL AREA (CLAY AND SILT)
DREDGED RIVER CHANNEL AREA
℄ OF NEW RIVER CHANNEL
U.S. 101
N

LAKE ALDWELL PLAN - SCENARIO 5
PHASE II - FINAL CONTOURS

FIGURE NO.

F36

ELWHA RIVER RESTORATION
LAKE MILLS
EXISTING CONTOURS AND PROFILE

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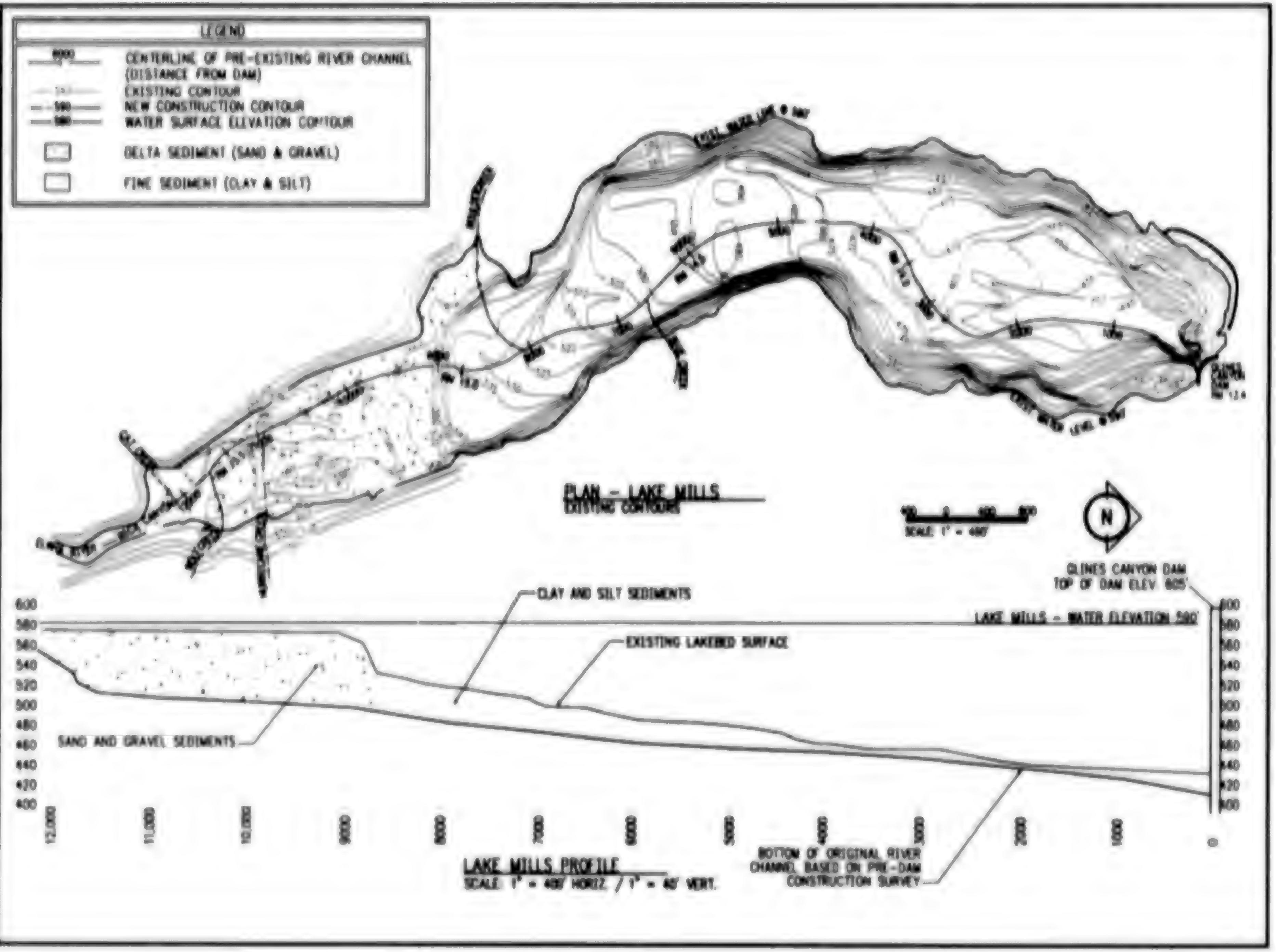
LEGEND
8000 CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
EXISTING CONTOUR
590 NEW CONSTRUCTION CONTOUR
590 WATER SURFACE ELEVATION CONTOUR
DELTA SEDIMENT (SAND & GRAVEL)
FINE SEDIMENT (CLAY & SILT)
EXIST. WATER LEVEL @ DAY
ELWHA RIVER
GLINES CANYON DAM RM 13.4
PLAN – LAKE MILLS
EXISTING CONTOURS
400 0 400 800
SCALE: 1" = 400'
N
GLINES CANYON DAM
TOP OF DAM ELEV. 605'
LAKE MILLS – WATER ELEVATION 590'
CLAY AND SILT SEDIMENTS
EXISTING LAKEBED SURFACE
SAND AND GRAVEL SEDIMENTS
BOTTOM OF ORIGINAL RIVER CHANNEL BASED ON PRE-DAM CONSTRUCTION SURVEY
600
580
560
540
520
500
480
460
440
420
400
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0

LAKE MILLS PROFILE

SCALE: 1" = 400' HORIZ. / 1" = 40' VERT.

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FIGURE NO.

F37

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 5
PHASE I - DELTA HYDRAULIC DREDGE OPERATION

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LEGEND

8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
580	EXISTING CONTOUR
580	NEW CONSTRUCTION CONTOUR
580	WATER SURFACE ELEVATION CONTOUR
▭	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)

PHASE I CONSTRUCTION ACTIVITY

- MAINTAIN PRESENT WATER SURFACE ELEVATION OF 580'.
- DREDGE SAND/GRAVEL SEDIMENTS FROM DELTA REGION USING SUBMERSIBLE PUMP DREDGES OPERATED BY BARGE.
- PUMP DREDGED MATERIAL DOWNSTREAM AND DEPOSIT UNDERWATER INTO BERMS WITH APPROXIMATELY 4:1 SIDE SLOPES.
- REMOVE LARGE ROCKS & DEBRIS FROM DREDGE SITE AS DREDGING IN DELTA REGION PROCEEDS. STOCKPILE ROCKS FOR FUTURE USE.
- MONITOR AND CONTROL SUSPENDED SEDIMENT DURING DEPOSITION. PLACE IMPERMEABLE SEDIMENT CURTAINS AROUND DEPOSITION SITE.
- CONTINUE PROCEDURE UNTIL FINAL RIVER CHANNEL HAS BEEN CREATED THROUGH DELTA SEDIMENTS. CHANNEL DREDGED TO APPROXIMATE ELEV. 520 AT DOWNSTREAM END OF DELTA.

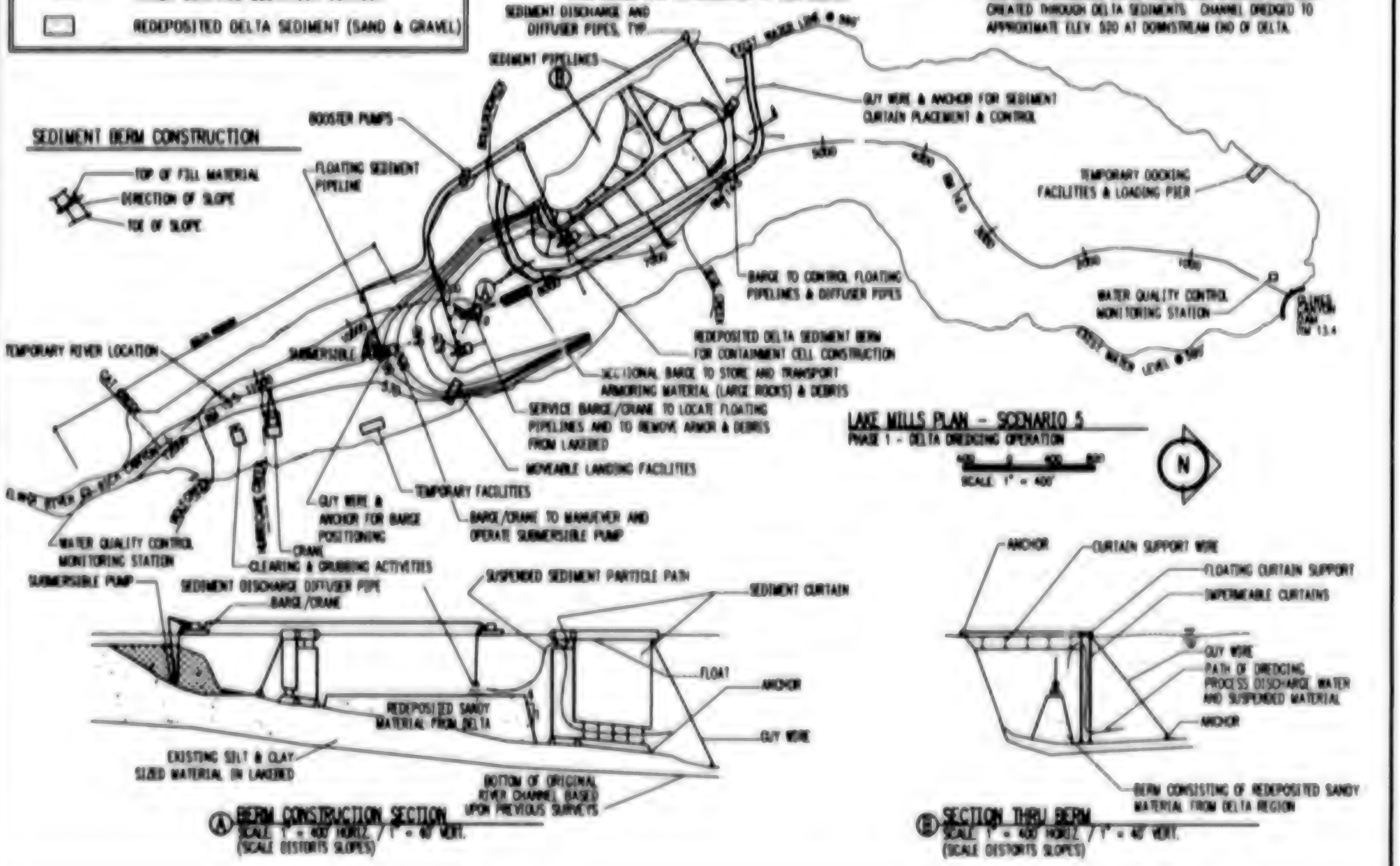
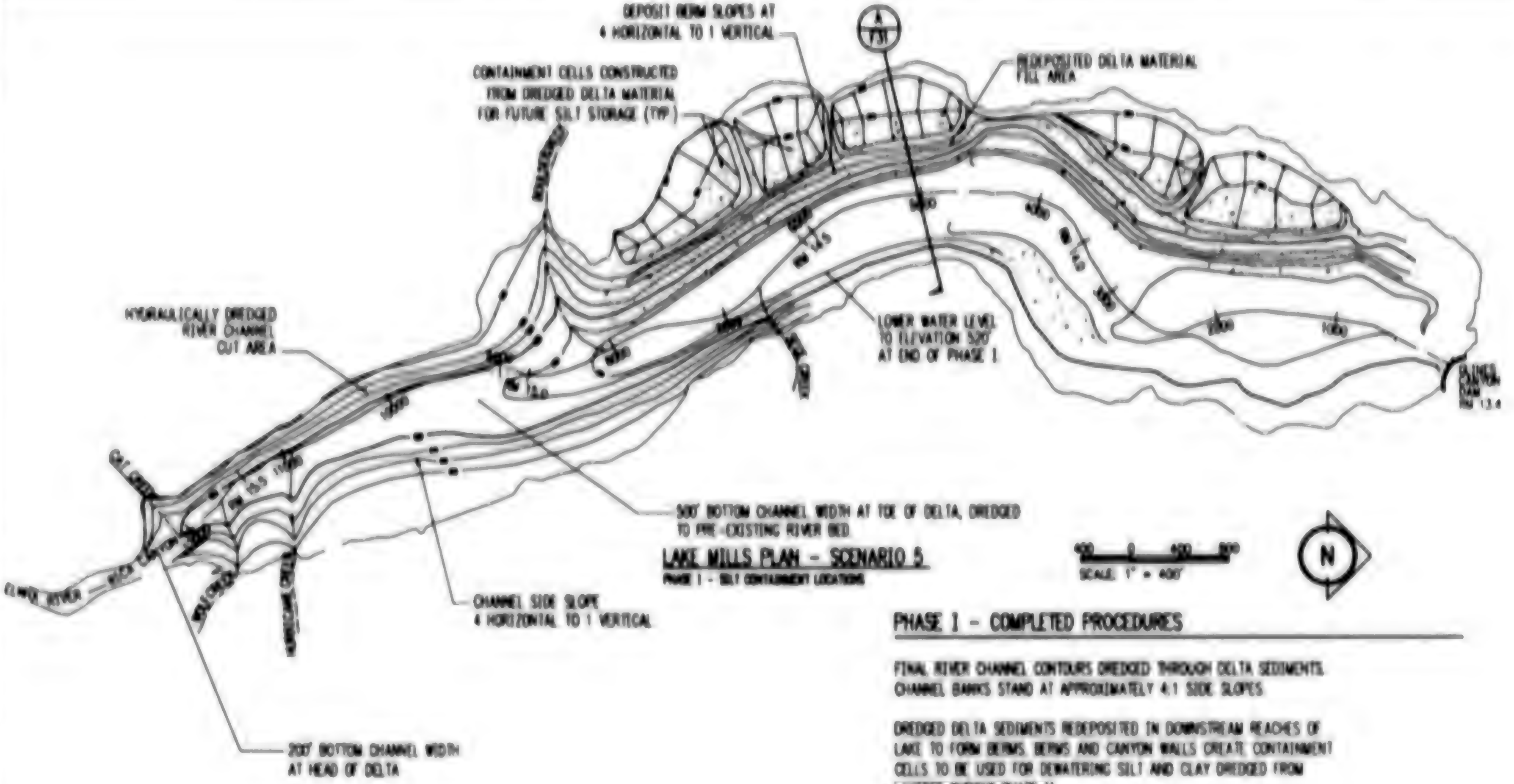

SEDIMENT DISCHARGE AND DIFFUSER PIPES, TYP.
SEDIMENT PIPELINES
EXIST. WATER LINE @ 580'
GUY WIRE & ANCHOR FOR SEDIMENT CURTAIN PLACEMENT & CONTROL
BOOSTER PUMPS
SEDIMENT BERM CONSTRUCTION
TOP OF FILL MATERIAL
DIRECTION OF SLOPE
TOE OF SLOPE
FLOATING SEDIMENT PIPELINE
TEMPORARY DOCKING FACILITIES & LOADING PIER
BARGE TO CONTROL FLOATING PIPELINES & DIFFUSER PIPES
WATER QUALITY CONTROL MONITORING STATION
GLINES CANYON DAM
TEMPORARY RIVER LOCATION
SUBMERSIBLE
REDEPOSITED DELTA SEDIMENT BERM FOR CONTAINMENT CELL CONSTRUCTION
SECTIONAL BARGE TO STORE AND TRANSPORT ARMORING MATERIAL (LARGE ROCKS) & DEBRIS
SERVICE BARGE/CRANE TO LOCATE FLOATING PIPELINES AND TO REMOVE ARMOR & DEBRIS FROM LAKEBED
EXIST. WATER LEVEL @ 580'
LAKE MILLS PLAN - SCENARIO 5
PHASE I - DELTA DREDGING OPERATION
SCALE: 1" = 400'
N
MOVEABLE LANDING FACILITIES
TEMPORARY FACILITIES
ELWHA RIVER
GUY WIRE & ANCHOR FOR BARGE POSITIONING
BARGE/CRANE TO MANUEVER AND OPERATE SUBMERSIBLE PUMP
CRANE
WATER QUALITY CONTROL MONITORING STATION
CLEARING & GRUBBING ACTIVITIES
SUBMERSIBLE PUMP
SEDIMENT DISCHARGE DIFFUSER PIPE
BARGE/CRANE
SUSPENDED SEDIMENT PARTICLE PATH
SEDIMENT CURTAIN
FLOAT
ANCHOR
REDEPOSITED SANDY MATERIAL FROM DELTA
GUY WIRE
EXISTING SILT & CLAY SIZED MATERIAL IN LAKEBED
BOTTOM OF ORIGINAL RIVER CHANNEL BASED UPON PREVIOUS SURVEYS
A BERM CONSTRUCTION SECTION
SCALE: 1" = 400' HORIZ. / 1" = 40' VERT.
(SCALE DISTORTS SLOPES)
ANCHOR
CURTAIN SUPPORT WIRE
FLOATING CURTAIN SUPPORT
IMPERMEABLE CURTAINS
GUY WIRE
PATH OF DREDGING PROCESS DISCHARGE WATER AND SUSPENDED MATERIAL
ANCHOR
BERM CONSISTING OF REDEPOSITED SANDY MATERIAL FROM DELTA REGION
B SECTION THRU BERM
SCALE: 1" = 400' HORIZ. / 1" = 40' VERT.
(SCALE DISTORTS SLOPES)

FIGURE NO.

F38

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 5
PHASE I - SILT CONTAINMENT LOCATIONS

SUMMIT TECHNOLOGY
CONSULTING ENGINEERS, INC. P.S.


DEPOSIT BERM SLOPES AT 4 HORIZONTAL TO 1 VERTICAL
CONTAINMENT CELLS CONSTRUCTED FROM DREDGED DELTA MATERIAL FOR FUTURE SILT STORAGE (TYP)
A
T31
REDEPOSITED DELTA MATERIAL FILL AREA
HYDRAULICALLY DREDGED RIVER CHANNEL CUT AREA
LOWER WATER LEVEL TO ELEVATION 520' AT END OF PHASE I
GLINES CANYON DAM
RM 13.4
500' BOTTOM CHANNEL WIDTH AT TOE OF DELTA, DREDGED TO PRE-EXISTING RIVER BED
CHANNEL SIDE SLOPE 4 HORIZONTAL TO 1 VERTICAL
200' BOTTOM CHANNEL WIDTH AT HEAD OF DELTA
ELWHA RIVER
CAT CREEK
BOULDER CREEK
2000
1000
SCALE 1" = 400'
N

LAKE MILLS PLAN - SCENARIO 5
PHASE I - SILT CONTAINMENT LOCATIONS

PHASE I - COMPLETED PROCEDURES

FINAL RIVER CHANNEL CONTOURS DREDGED THROUGH DELTA SEDIMENTS. CHANNEL BANKS STAND AT APPROXIMATELY 4:1 SIDE SLOPES.

DREDGED DELTA SEDIMENTS REDEPOSITED IN DOWNSTREAM REACHES OF LAKE TO FORM BERMS. BERMS AND CANYON WALLS CREATE CONTAINMENT CELLS TO BE USED FOR DEWATERING SILT AND CLAY DREDGED FROM LAKEBED DURING PHASE II.

WATER SURFACE LOWERED TO ELEVATION 520' FOR PHASE II PROCEDURES. LANDSCAPING ACTIVITIES BEGIN IN DELTA REGION.

PHASE I - MATERIAL VOLUMES

CUT VOLUME - HYDRAULICALLY DREDGED DELTA SEDIMENTS...4.3 mil. CU.YDS. SAND/GRAVEL

FILL VOLUME - REDEPOSITED DELTA SEDIMENTS................4.5 mil. CU.YDS. SAND/GRAVEL
(5% COEFFICIENT OF EXPANSION ASSUMED)

LEGEND	
8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
	EXISTING CONTOUR
590	NEW CONSTRUCTION CONTOUR
590	WATER SURFACE ELEVATION CONTOUR
▭	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)

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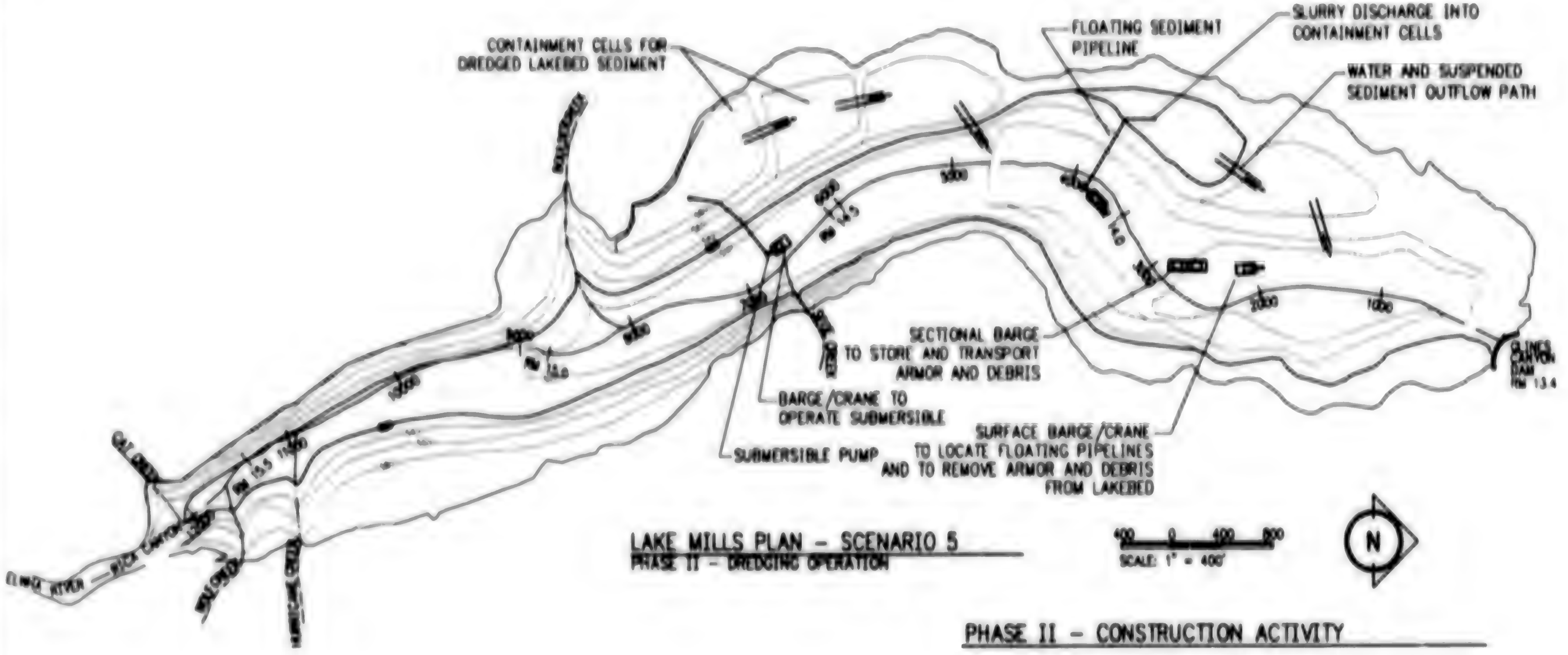
FIGURE NO.
F39

ELWHA RIVER RESTORATION
LAKE MILLS - SCENARIO 5
PHASE II - DREDGING OPERATION

SUMMIT TECHNOLOGY
CONSULTING ENGINEERS, INC. P.S.


CONTAINMENT CELLS FOR DREDGED LAKEBED SEDIMENT
FLOATING SEDIMENT PIPELINE
SLURRY DISCHARGE INTO CONTAINMENT CELLS
WATER AND SUSPENDED SEDIMENT OUTFLOW PATH
SECTIONAL BARGE TO STORE AND TRANSPORT ARMOR AND DEBRIS
BARGE/CRANE TO OPERATE SUBMERSIBLE
SUBMERSIBLE PUMP
SURFACE BARGE/CRANE TO LOCATE FLOATING PIPELINES AND TO REMOVE ARMOR AND DEBRIS FROM LAKEBED
GLINES CANYON DAM RM 13.4
CAT CREEK
ELWHA RIVER
RM 15.5
11000
10000
9000
8000
6000
RM 14.5
5000
4000
3000
2000
1000
RM 14.0
400 0 400 800
SCALE: 1" = 400'
N

LAKE MILLS PLAN - SCENARIO 5
PHASE II - DREDGING OPERATION

PHASE II - CONSTRUCTION ACTIVITY

HYDRAULIC DREDGING OF FINE SEDIMENT IN LAKE BED.

DEPOSIT DREDGED LAKEBED MATERIAL INTO CONTAINMENT CELLS.

LOWER LAKE LEVEL.

BEGIN GRADING AND LANDSCAPING.

LEGEND	
8000	CENTERLINE OF PRE-EXISTING RIVER CHANNEL (DISTANCE FROM DAM)
590	EXISTING CONTOUR
590	NEW CONSTRUCTION CONTOUR
590	WATER SURFACE ELEVATION CONTOUR
▭	REDEPOSITED DELTA SEDIMENT (SAND & GRAVEL)

ELWHA RIVER RESTORATION
17-Aug-93
COST ESTIMATE SUMMARY

SCENARIO 1
(Itemized costs taken from Hosey Report, Dec. 1, 1989)

Lake Mills		
- Excavate all fine lakebed material and granular delta material	11,150,000	CY
- Haul material to upland disposal site		
Lake Aldwell		
- Excavate all fine and granular material and haul to upland site	2,560,000	CY

Task Description		**Cost**	
Lake Mills			
Disposal site		$2,000,000	
Transp. & Facilities		$6,303,900	
Load and Haul material		$37,575,500	
Contingency	25%	$11,469,850	
Overhead	10%	$4,587,940	
Profit	8%	$3,670,352	
Tax	8%	$5,248,603	
Subtotal Lake Mills		**$70,856,145**	
Lake Aldwell			
Load and Haul material		$6,912,000	
Disposal site restoration		$2,000,000	
Contingency	25%	$2,228,000	
Overhead	10%	$891,200	
Profit	8%	$712,960	
Tax	8%	$1,019,533	
Subtotal Lake Aldwell		**$13,763,693**	
Engineering and Construction Management	15%	$12,692,976	
Total Cost - Scenario 1		**$97,312,814**	
Total Material Excavated		13,710,000	CY
Unit Cost Per Cubic Yard - Scenario 1		$7.10	

SCENARIO 2

(Itemized costs taken from Hosey Report, Dec. 1, 1989)

Lake Mills		
- Excavate all fine lakebed material and granular delta material	11,150,000	CY
- Haul material to open water disposal site		
Lake Aldwell		
- Excavate all fine and granular material and haul to open water site	2,560,000	CY

Task Description		**Cost**	
Lake Mills			
Barge Facility		$2,600,000	
Transp. & Facilities		$12,106,880	
Load and Haul material		$50,175,000	
Barge to Disposal Site		$27,875,000	
Contingency	25%	$23,189,220	
Overhead	10%	$9,275,688	
Profit	8%	$7,420,550	
Tax	8%	$10,611,387	
Subtotal Lake Mills		**$143,253,725**	
Lake Aldwell			
Load and Haul material		$8,704,000	
Barge to disposal site		$6,400,000	
Road and Barge Facility Restor.		$1,203,000	
Contingency	25%	$4,076,750	
Overhead	10%	$1,630,700	
Profit	8%	$1,304,560	
Tax	8%	$1,865,521	
Subtotal Lake Aldwell		**$25,184,531**	
Engineering and Construction Management	15%	$25,265,738	
Total Cost - Scenario 2		**$193,703,995**	
Total Material Excavated		13,710,000	CY
Unit Cost Per Cubic Yard - Scenario 2		$14	

SCENARIO 3

Lake Mills	3,745,000	
- Erode 1/4 of 7.3 mcy of gravel & 1/2 of 3.84 mcy of silt & clay material	7,401,750	
- Dredge the remaining material into the river flow		
Lake Aldwell		
- Erode 1/4 of 1.47 mcy gravel & 1/2 of 1.09 mcy of silt & clay of material	912,500	
- Dredge the remaining material into the river flow	1,647,500	
Midriver and downstream of Elwha dam		
- Mechanical maintenance of aggraded material over 15 year period		
- Assume 25% of gravel volume dredged again twice	4,385,000	
Total Material Dredged	9,042,500	CY
Material Dregded for River Maintenance	4,385,000	CY

Task Description		**Cost**	
Lake Mills & Lake Aldwell			
Sediment erosion and dredging		$23,889,081	
River Maintenance		$11,584,586	
Transp. & Facilities	11.2%	$3,973,051	
Mobilization	15%	$5,917,008	
Contingency	50%	$22,681,863	
Overhead	10%	$4,536,373	
Profit	8%	$3,629,098	
Tax	8%	$6,096,885	
Subtotal Lake Mills and Aldwell		**$82,307,944**	
Engineering and Construction Management	15%	$12,346,192	
Total Cost - Scenario 3		**$94,654,136**	
Total Material Removed		13,427,500	CY
Unit Cost Per Cubic Yard - Scenario 3		$7.05	

SCENARIO 4

Lake Mills		
- dredge lakebed material past dam	3,840,000	CY
- sediment will be transported in river as suspended sediment		
- granular material in delta eroded to create 250' channel at 0.6% slope	3,340,000	CY
- fine sediment in washed out of granular material	(835,000)	CY
- dredge granular delta material from Mills and relocate in Lake Aldwell	**2,505,000**	CY
- 35% of fine Mills lakebed sediment trapped by Lake Aldwell	1,344,000	CY
- 35% of fine sediment washed from Mills delta material trapped in Lake Aldwell	292,250	CY
Lake Aldwell		
- trap fine material washed out from Lake Mills	1,636,250	CY
- existing fine lakebed material in Lake Aldwell	1,090,000	CY
- dredge fine material past dam and washout	**2,726,250**	CY
- Total available storage volume in Lake Aldwell before sediment relocation	3,500,000	CY
- Aldwell material relocated in upper reaches of Aldwell to create 500' channel	(890,000)	CY
- Available storage for material piped from Lake Mills	**2,610,000**	CY
- Imported slope protection material (rip rap) required	76,500	CY

TASK DESCRIPTION				**COST**
Lake Mills				
Dredge fine sediment	3,840,000	cy	$2.64	$10,144,769
Pump sediment over dam	3,000	lf	$370	$1,111,000
Dredge course sediment	2,505,000	cy	$2.64	$6,617,877
Pipeline from Lake Mills to Aldwell	52,800	lf	$765	$40,377,500
Lake Aldwell				
Dredge fine sediment	2,726,250	cy	$2.64	$7,202,390
Pump sediment over dam	5,000	ft	$370	$1,851,667
Dredge and retain course sediment	890,000	cy	$2.64	$2,351,262
Slope protection	76,500	cy	$23.00	$1,759,500
Subtotal Lake Mills and Aldwell				**$71,415,963**
Transportation and Facilities				$7,801,524
Mobilization			15%	$11,882,623
Contingency			25%	$22,775,027
Overhead			10%	$11,387,514
Profit			8%	$9,110,011
Tax			8%	$10,749,813
Engineering and Construction Management			15%	$21,768,371
Total Cost - Scenario 4				**$166,890,846**

Total material dredged	9,961,250	CY
Unit Cost Per Cubic Yard - Scenario 4	$16.75	

SCENARIO 5

Lake Mills		
- Dredge delta sediments to lower lake into berms		
- Create channel 250' into 500' wide at end of delta	4,100,000	CY
- Retain fines in sediment berms	2,300,000	CY
Lake Aldwell		
- Relocate to create a channel 500' wide through delta	890,000	CY
- Relocate fines in sediment berms	1,090,000	CY

Task Description		
Lake Mills		**Cost**
Transportation and staging		$321,250
Facilities		$122,327
Delta Material Relocation- Phase 1		$15,901,821
Lakebed Dredging - Phase 2		$6,045,343
Mobilization		$2,165,059
Contingency	25%	$6,138,950
Overhead	10%	$3,069,475
Profit	8%	$2,455,580
Tax	8%	$2,897,584
Subtotal Lake Mills		**$39,117,390**
Lake Aldwell		
Transportation and staging		$188,000
Facilities		$78,297
Delta Material Relocation - Phase 1		$6,198,195
Lakebed Dredging - Phase 2		$2,327,762
Mobilization		$1,002,100
Contingency	25%	$2,448,589
Overhead	10%	$1,224,294
Profit	8%	$979,435
Tax	8%	$1,155,734
Subtotal Lake Aldwell		**$15,602,407**
Engineering and Construction Management	15%	$8,207,969
Total Cost - Scenario 5		**$62,927,766**
Total Material Relocated		8,380,000 CY
Unit Cost Per Cubic Yard - Scenario 5		$7.51

SCENARIO 6

Lake Mills		
- Erode delta sediments to stable slope		
- Relocate to create channel 250' wide at 0.6% slope	3,340,000	CY
- Retain fines in sediment berms	2,800,000	
		CY
Lake Aldwell		
- Relocate to create a channel 500' wide through delta	890,000	CY
- Relocate fines in sediment berms	1,090,000	CY

Task Description			
Lake Mills		**Cost**	
Transportation and staging		$321,250	
Facilities		$154,308	
Delta Erosion		$13,006,851	
Lakebed dredging		$7,519,089	
Mobilization		$1,677,500	
Contingency	25%	$5,669,750	
Overhead	10%	$2,834,875	
Profit	8%	$2,267,900	
Tax	8%	$2,676,122	
Subtotal Lake Mills		**$36,127,644**	
Lake Aldwell			
Transportation and staging		$85,603	
Facilities		$41,118	
Delta Erosion		$5,063,381	
Lakebed dredging		$2,003,590	
Mobilization	8%	$575,495	
Contingency	20%	$1,553,837	
Overhead	10%	$932,302	
Profit	8%	$745,842	
Tax	8%	$880,093	
Subtotal Lake Aldwell		**$11,881,262**	
Engineering and Construction Management	15%	$7,201,336	
Total Cost - Scenario 6		**$55,210,242**	
Total Materail Relocated		8,120,000	CY
Unit Cost Per Cubic Yard - Scenario 6		$6.80	

SCENARIO 7

Lake Mills		
- Dredge fine material from lake bed	3,843,000	CY
- Erode delta to create channel 250' wide at 0.6% slope	3,340,000	CY
- Relocate eroded delta material to create river channel in lake area		
Lake Aldwell		
- Relocate delta material to create a channel 500' wide through delta	890,000	CY
- Dredge fine lakebed material into river and washout	1,090,000	CY

Task Description		**Cost**
Lake Mills		
Transportation and staging		$321,250
Facilities		$160,665
Phase 1 Lakebed Sediments Removal		$8,213,345
Phase II Delta Materail Removal and Relocation		$11,906,163
Mobilization		$1,645,494
Contingency	25%	$5,561,729
Overhead	10%	$2,780,865
Profit	8%	$2,224,692
Tax	8%	$2,625,136
Subtotal Lake Mills		**$35,439,339**
Lake Aldwell		
Transportation and staging		$74,398
Facilities		$37,208
Phase 1 Lakebed Sediments Removal		$1,902,128
Phase II Delta Materail Removal and Relocation		$2,757,347
Mobilization	8%	$381,687
Contingency	25%	$1,288,192
Overhead	10%	$644,096
Profit	8%	$515,277
Tax	8%	$608,027
Subtotal Lake Aldwell		**$8,208,360**
Engineering and Construction Management	15%	$6,547,155
Total Cost - Scenario 7		**$50,194,853**

Total Material Dredged	9,163,000	CY
Unit Cost Per Cubic Yard - Scenario 7	$5.48	

SCENARIO 8

Lake Mills		
- Excavate all granular delta material	7,309,000	CY
- haul material to upland disposal site		
- dredge and washout all fines in lakebed	3,843,000	CY
Lake Aldwell		
- excavate granualr delta material and haul to upland site	1,470,000	CY
- dredge and washout all fines in lakebed	1,090,000	CY

Task Description		**Cost**
Lake Mills		
Preparation of Upland site		$2,000,000
Transp. & Facilities		$6,303,900
Load and Haul delta material		$26,107,896
Lakebed washout		$10,152,694
Contingency	25%	$11,141,123
Overhead	10%	$4,456,449
Profit	8%	$3,565,159
Tax	8%	$5,098,178
Subtotal Lake Mills		**$68,825,399**
Lake Aldwell		
Load and Haul delta material		$5,250,870
Washout lakebed		$2,879,635
Disposal site restoration		$2,000,000
Contingency	25%	$2,532,626
Overhead	10%	$1,013,050
Profit	8%	$810,440
Tax	8%	$1,158,930
Subtotal Lake Aldwell		**$15,645,551**
Engineering and Construction Management	15%	$12,670,642
Total Cost - Scenario 8		**$97,141,592**

Total Material Removed - Scenario 8	13,712,000	CY
Unit Cost Per Cubic Yard - Scenario 8	$7.09	

APPENDIX G

FISH RESTORATION PLAN

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APPENDIX G

FISH RESTORATION PLAN

I. Introduction

This plan provides a description, timeline, and cost estimate to achieve full restoration of Elwha River native anadromous fisheries under the assumption that the Elwha and Glines Canyon dams are removed, and builds on all available information generated over the past decade. Also, this plan allows for the incorporation of new information developed during current and future fisheries investigations. Fish restoration activities described in this plan would begin in 1994, upon Congressional approval, and continue for 18 years thereafter to complete activities related to fish stock assessment, hatchery brood development, reintroduction by juvenile outplanting and other means, and interim and final evaluations of the effort.

The 10 fish stocks that historically used the Elwha River basin prior to construction of the dams are addressed, including winter and summer steelhead, sea-run cutthroat trout and native char (Dolly Varden and bull trout), spring and summer/fall chinook, coho, pink, chum, and sockeye salmon. For the purposes of this plan, a fish stock is considered a discrete population which does not interbreed to any substantial degree with any other stock due to separation in space and/or time from other stocks (WDF et al. 1993). Also, this plan assumes:

- Anadromous fish would not be reintroduced in the upper Elwha River until safe downstream passage at the dam sites is assured.

- The viability of lower river fish habitat and fish facilities (Figure G-1) during dam removal depends on the sediment management scenario employed. Potential measures (i.e., the development of "clean" water sources for the fish facilities, captive broodstock collection for affected species) may be available to mitigate temporary impacts (e.g., high turbidity, sediment deposition) during dam removal.

- Juvenile outplanting is desirable to reintroduce most fish stocks in the upper basin because 1) outplanting would markedly accelerate the reintroduction of anadromous fish to the upper river compared to natural recolonization, and 2) outplanting would permit, in certain cases, selective reintroduction of stocks that may be better suited to sustained natural production in the Elwha River than those that presently exist in the lower river.

More than one option for restoring most fish stocks is presented.

This approach should improve the prospects for fully restoring all anadromous fisheries in the shortest time. Anadromous fish released in previously inaccessible habitat may require varying amounts of time and variable levels of outplanting before full utilization of the habitat can be expected.

Although not a primary option in most cases, reliance on natural recolonization has been included in all instances where existing runs are present. Under this option, adult fish can be expected to penetrate the upper drainage and reestablish themselves over varying lengths of time once access is provided. This approach can be effective, as demonstrated on the South Fork of the Skykomish River where new habitat became available to adult salmon above Sunset Falls. Runs of chinook and pink salmon were largely established by allowing adults access to this new habitat, as opposed to intensive juvenile outplanting of these species (Seiler 1991).

More than one option is presented for restoring most fish stocks with all options described in priority order. Restoration efforts would initially be directed towards all options, but those options that demonstrate the most promise would be pursued based on the priority shown. For two fish stocks (sea-run cutthroat trout and native char), natural recolonization is the only restoration option presented. This is due to the belief that these fish will fully recover on their own. The lack of hatchery support facilities for these stocks in the Elwha River basin is also a consideration.

II. Restoration Options

Principal restoration activities for all stocks (except sea-run cutthroat and native char) fall into five general categories, for which timelines and costs follow.

Stock status assessment. Additional stock status information is needed to determine the suitability and availability of most Elwha stocks for restoration. Although use of native fish stocks should yield the greatest adult return (Reisenbichler 1988, Nickelson et al. 1986) and native stock is the first priority in restoration options (when available), past hatchery introductions and loss of upriver habitat have significantly reduced or eliminated a number of native Elwha fish stocks. Stock status assessments are a necessary first step in identifying and developing the most promising sources of broodstock for restoration. These activities would occur in advance of dam removal, if possible, so sources of fish are available for outplanting at the first opportunity following dam removal.

Broodstock development and maintenance. Hatchery support is necessary to develop broodstock for juvenile outplanting. For this purpose, the two existing fish facilities in the lower river

(Washington Department of Fisheries'(WDF) Rearing Channel and the Lower Elwha S'Klallam Tribe's (LET) Hatchery) would be improved to produce juvenile fish for outplanting. Use of facilities within the basin reduces logistical costs of fish transfer and the possibility of future fish transfer restrictions due to fish disease concerns. Facility modifications would include improvements to water supplies and upgrades in incubation and support capabilities as noted under COSTS.

Fish collections for brood development would rely on traditional netting and/or hook-and-line sampling. A reconnaissance engineering survey (Rainey 1993) indicated little potential for temporary weirs or similar devices for collecting salmon and steelhead brood in the lower Elwha River.

Outplanting. Outplanting of all stocks would occur for two cycles (8 to 10 years, to allow for uncertainty in stock availability) at levels consistent with carrying capacity. Carrying capacity estimates are based on Hosey and Associates (1988) habitat surveys. Stocks with potentially long rearing between outplanting and emigration would be planted in the low range of their expected carrying capacity, while pre-smolts would be planted at or near carrying capacity. Any additional planting considerations are noted below by stock.

For outplanting purposes, the river basin was divided into reaches believed most suitable for initial reintroduction of each stock. The Carlson Canyon Falls (RM 34) was considered the division between spring and summer/fall chinook salmon habitat and between summer and winter steelhead habitat. The Rica Canyon entrance (RM 16) was considered the upper limit of pink and chum salmon habitat. No outplanting would occur above reported natural barriers.

Outplanting methods would vary by location. Above RM 16, outplanting of all stocks would occur by helicopter airlift (Wunderlich et al. 1993) due to a lack of road access. Below RM 16, outplanting would occur by conventional tank truck.

Temporary conditioning, or acclimation, ponds would be employed where possible for chinook and steelhead presmolt outplants to increase survival and adult returns to the vicinity of the ponds. Such ponds would consist of side channels fitted with temporary water control structures to allow short-term (approximately one month) holding and rearing prior to initial emigration.

Harvest Management. Management of impacting fisheries is an integral part of fisheries restoration. Over the rebuilding period, harvest rates would be phased down on stocks presently supported by hatchery production (summer/fall chinook salmon, coho salmon, winter and summer steelhead) to a level conducive to wild production. Guidelines for achieving these harvest management goals are found in the Puget Sound Salmon Management Plan and the draft Salmon and Steelhead Management Plan for Strait of Juan de Fuca Terminal Areas.

Primary harvest management responsibilities are shared by the State of Washington (WDF and WDW), the Tribes, and Olympic National Park. More specifically, the Lower Elwha S'Klallam Tribe has the primary responsibility for managing tribal fisheries in the Elwha River and other terminal areas in the Strait of Juan de Fuca. WDF and WDW are responsible for the management of marine and freshwater (outside the Park) non-tribal salmon and steelhead fisheries, while Olympic National Park is responsible for managing non-tribal fisheries within Park boundaries.

Although the State and Tribes have the primary harvest management responsibilities in marine waters, harvest management actions must be coordinated with the Pacific Fisheries Management Council and the Pacific Salmon Commission. In addition, the State and Tribes shall consult with the Elwha Restoration Interagency Team (yet to be formally authorized) on a regular basis.

Evaluation. Evaluation is a necessary and integral component of the restoration plan. Evaluation components include selection of appropriate brood sources where more than one potential source exists, refinement of the restoration plan as more information on existing stock status becomes available, and determination of the effectiveness of reintroduction measures as indicated by adult returns or, in some cases, smolt output and survival (i.e., coho salmon and steelhead).

A summary of restoration options for all stocks appears in Table G-1, and a detailed description of each restoration option follows. A timeline of restoration activities for all options appears in Table G-2 and an outplanting program for all stocks appears in Table G-3. For reference, a brief summary of current Elwha stock status precedes each stock's restoration options. Additional information on Elwha fish stock status is available in WDF et al. (1993).

A. WINTER STEELHEAD

Elwha Stock Status. The early portion of the winter run steelhead (December through March) is largely based on LET hatchery production of non-native stock, while the late portion of the winter run steelhead (mid-February through June) is considered a mixed[1], wild[2] stock which is depressed[3] because of habitat loss associated with the Elwha dams (WDF et al. 1993). Escapement of late-run winter steelhead is unknown.

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[1] Originating from commingled native and non-native parents.

Option 1A: Develop a native run from the upper river rainbow trout population. Olympic National Park, in association with the Seattle National Fishery Research Center of the U.S. Fish and Wildlife Service (FWS), proposed a cooperative brood development project for restoration of Elwha winter steelhead using the existing rainbow trout population in the upper river as a steelhead brood source (Meyer 1992). Genetic work conducted by Reisenbichler and Phelps (1989) revealed that these trout may be descendants of the original Elwha steelhead which were trapped in the upper river when Elwha Dam closed. Steelhead smolts recently collected in the Eicher fish screen at Elwha Dam may have originated from the upper river rainbow trout population (Stone and Webster Engineering Corporation 1991). This is plausible, as analogous rainbow/steelhead populations are suspected to exist above manmade barriers in the mid-Columbia River, and these headwater rainbow trout populations are believed to produce steelhead smolts (Mullan et al. 1992).

Adult rainbow trout from the upper river would be captured for one cycle (4 years) beginning in the spring of 1993 from the Elkhorn Ranger Station (RM 25) and above, where Reisenbichler and Phelps (1989) suggested the presence of native Elwha steelhead. These fish would be transferred to the LET hatchery for spawning, and their progeny would be coded-wire-tagged and released as smolts. Smoltification indicators (ATPase, saltwater challenge, morphometric and coloration changes) would be monitored in all juveniles to determine the optimal time of smolt release. Anadromous adults returning from these releases would be used as a source of broodstock for outplanting below RM 34.

Option 1B: Rely on upper river rainbow trout population to reestablish native run. Pursued concurrently with Option 1A, this option also relies on development of a native run from the upper river rainbow trout population. Steelhead smolts emigrating from the upper river would be trapped at the Elwha Dam Eicher screen or by scoop trap at RM 11 to determine their potential for reestablishing a native winter run.

The source and magnitude of smolt output would be assessed. Smolts would be examined for smoltification indices and compared to the upper river rainbow population by means of electrophoresis. Electrophoresis would assist in determining the

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[2] Sustained by natural spawning and rearing in the natural habitat.

[3] Production is below expected levels based on available habitat.

influence of non-native rainbow trout that were released in the upper river from at least 1949 to 1975 (Wunderlich 1992). The magnitude of the outmigrant population would be estimated from trap efficiency data (Wunderlich et al. 1989) or dam passage data (Wunderlich and Dilley 1986), depending on collection site.

If the outmigrating population appears to be the native stock and sufficient numbers are available, subsequent collections would be coded-wire-tagged to determine survival and return timing. If smolt output were sufficient and return timing were consistent with a winter run, this option would ultimately rely on natural reestablishment of the run after dam removal.

Option 2: Enhance late-run, lower river stock. This option, pursued concurrently with Options 1A and 1B, involves evaluation and enhancement of the existing late-run stock in the lower river followed by outplanting after dam removal. The existing late-run stock is known to be primarily of wild origin (WDF et al. 1993, Winter 1989, Wunderlich and Hager 1993). However, additional information on genetic composition is needed to determine how close it may be to the original Elwha stock and its availability for restoration. This information would be gathered incidental to the LET spring chinook gillnet study (described below) beginning in spring of 1993. Incidental catches of late-run steelhead in this fishery would allow estimation of run strength and evaluation of brood collection techniques. Because of the depressed status of this stock, non-lethal electrophoretic sampling (Robbins et al. 1988) would be employed, if feasible, to determine the genetic makeup of late-run steelhead.

As an added measure to conserve the remaining wild stock during evaluation and brood development, winter run hatchery releases from the LET hatchery would be marked (adipose-clipped) beginning in 1994. Management could then institute catch-and-release for wild stock in the lower river steelhead fishery.

Option 3: Import a suitable Olympic Peninsula stock. Concurrently with all of the above options, suitable Olympic Peninsula stocks would be screened for possible introduction in the Elwha River. Criteria for use would include availability for transfer in terms of abundance and agreement with other management entities (State and tribal), and whether fish health guidelines for inter-zone transfer could be successfully met. Although screening of potential stocks would proceed concurrently with all of the above options, a stock would not be imported unless Options 1 and 2 did not meet expectations.

Option 4: Rely on natural recolonization by lower river stock. Natural recolonization of the upper river is expected to occur over an uncertain time period once access to the upper river is reestablished. Because of the strong non-native influence in the early returning portion of the run due to the hatchery program, this option is considered least desirable.

B. SUMMER STEELHEAD

Elwha Stock Status. Although escapement is unknown, summer run steelhead are considered depressed due to the loss of habitat associated with the Elwha dams (WDF et al. 1993). As well, the Washington Department of Wildlife (WDW) annually releases non-native summer steelhead (Skamania stock) in the lower river from the Bogachiel Rearing Ponds.

Option 1A: Develop a native run from the upper river rainbow trout population. This option is the same as Option 1A for winter steelhead, except that outplanting would occur above RM 34. It is possible that a component of the landlocked rainbow trout population in the upper watershed would display summer return timing, which could then be used for eventual outplanting following the same schedule as winter steelhead (Table G-2). Activities involved in option 1A for winter steelhead thus apply to both winter and summer steelhead brood development.

Option 1B: Rely on the upper river rainbow trout population to reestablish native run. This option is the same as Option 1B for winter steelhead. As noted above, it is possible that a component of the landlocked rainbow trout population in the upper watershed would display summer return timing.

Option 2: Rely on natural recolonization by lower river stock. Natural recolonization of the upper river would occur over an uncertain time period once access to the upper river is provided. In the absence of other measures to introduce summer steelhead in the uppermost reaches of the basin, the lower river stock would gradually penetrate the watershed, but the recolonization period could be lengthy given the depressed status of the stock. To reduce non-native hatchery influence in the lower river stock prior to dam removal, WDW hatchery releases from the Bogachiel Rearing Ponds would be discontinued beginning in 1994.

Option 3: Import a suitable West Olympic Peninsula stock. Concurrently with the above options, the Queets and Hoh River summer steelhead stocks on the West Olympic Peninsula would be assessed to see if they might serve as donor stocks for Elwha River restoration. If Options 1 and 2 fail and a West Olympic Peninsula stock is available, brood collection and transfer would occur, subject to management (State and tribal) agreement and fish disease restrictions. Stock assessment in this option would consist of (1) the identification of the summer steelhead range through literature review and field survey, (2) the estimation of population size by means of sport and commercial fishery sampling, and (3) the determination of appropriate escapement goals by means of summer low flow habitat measurements.

Option 4: Enhance native component of lower river stock. This option involves enhancement of any remaining native component of the lower Elwha River stock followed by outplanting in the watershed above RM 34. However, the depressed status of this stock, coupled with a history of non-native hatchery releases in the lower river, suggest that few natives are left. Incidental capture of summer run steelhead in the LET spring chinook gillnet study should provide an opportunity to assess presence of native summer steelhead for restoration.

C. SEA-RUN CUTTHROAT AND NATIVE CHAR

Elwha Stock Status. Status of native sea-run cutthroat and native char in the lower river is unknown, but both populations are likely negatively affected by the loss of access to the upper river and habitat degradation in the lower river due to the Elwha dams. Sea-run cutthroat in the lower river may be limited by the lack of small tributaries for spawning and rearing below Elwha Dam. No past enhancement of sea-run cutthroat has occurred in the Elwha River and no WDW enhancement facilities for sea-run cutthroat are located in the vicinity of the Elwha River.

Option 1: Rely on natural recolonization. Natural recolonization of the upper river would occur over an uncertain time period once access to the upper river is reestablished. Remnant, landlocked forms of both species may exist in the upper watershed in an analogous manner to rainbow/steelhead, noted above. These resident populations may contribute to the reestablishment of native anadromous populations after removal of the Elwha dams.

D. SPRING CHINOOK SALMON

Elwha Stock Status. Spring chinook salmon, if present, are undoubtedly few in numbers. Loss of access to upriver habitat due to the Elwha dams, coupled with possible co-temporal spawning with other chinook in the lower river, have reduced their numbers and perhaps their genetic distinction from later timed chinook. Limited non-native hatchery releases of Soleduc and Dungeness spring chinook were made in the lower Elwha River in 1973 and 1977, respectively.

A spring chinook gillnet study conducted in 1992 suggested a remnant run may still exist (Wunderlich and Hager 1993). An estimated 24 chinook entered the river within the Elwha spring chinook management period (WDF et al. 1992). However, this management period is under technical review and additional information on status and timing are essential to characterize potential overlap with the adjacent summer/fall chinook management period (WDF et al. 1990).

Option 1A: Outplant juvenile summer/fall Elwha stock and rely on natural processes to establish an early run. This restoration strategy involves collecting eggs across the range of the Elwha chinook spawning timing followed by outplanting juveniles in the uppermost reaches of the basin. Outplanting juveniles would accelerate the process of introducing the stock within its assumed historic range (above RM 34).

When exposed to the upper river's environment, the existing summer/fall stock can be expected to exhibit an earlier timed component (spring type), although it may take some generations for this expression to manifest itself. An earlier timed component would respond in part to the upper river's cooler temperature regimen, requiring earlier return and spawn timing to complete the life cycle (Brannon and Hershberger 1983). Among Pacific salmon, chinook are known to adapt rapidly to new situations (Healey 1991). Significant shifts in spawning timing have been reported in response to new environmental conditions (Kwain and Thomas 1984).

Presmolts would be outplanted in early May (Table G-3). This outplanting strategy would have two significant benefits in restoring a natural run to the upper Elwha River:

- It would allow at least some imprinting to improve returns to the upper river, yet minimize interference with natural emigration (which can negatively affect marine migration and survival). Outplanting would occur before any appreciable emigration pulse could be expected based on previous Elwha emigration studies and data on smolt readiness (ATPase) for this stock (Wunderlich and Dilley 1990).

- It would mimic the expected time and size of natural outmigrants which should improve survival and adult return (Reimers 1979). Time and size of outplanting would correspond closely to that previously observed among chinook emigrating from the upper Elwha River (Dilley and Wunderlich 1990).

Option 1B: Enhance and outplant early portion of Elwha chinook run. This option, pursued concurrently with Option 1A, consists of developing a brood run from the early returning portion of the Elwha chinook run and outplanting juveniles as noted in Option 1A. Key considerations include whether sufficient broodstock could be collected and whether adequate hatchery support would be available.

Further assessment of the early returning portion of the run would occur to determine brood availability and fish collection methods. Optimally, at least several hundred breeding individuals are desirable to avoid long-term problems of inbreeding and loss of genetic variability (Waples 1991). Previous (Wunderlich and Hager 1993) and ongoing (LET) spring chinook gillnetting would identify the magnitude of the early returning component and determine if it is distinct from the relatively abundant summer/fall run.

If brood were collected during spring entry, specific measures would be taken to reduce prespawning mortality at the hatchery. Adequate water quality and protected holding facilities would be provided. The critical holding period could be significantly shortened by the following measures:

- Administering luteinizing hormone (LHRHa) to broodstock.
- Artificially reducing photoperiod to stimulate earlier maturation, such as is accomplished at Little White National Fish Hatchery (lower Columbia River) by holding chinook in covered raceways and reducing photoperiod by four minutes daily, or about one-half hour per week, until full maturation.

Option 2: Import Dungeness River stock from Dungeness River basin. This option entails importing spring/summer Dungeness chinook salmon from the Dungeness basin, if the above restoration options do not meet expectations and brood is available. Outplanting would follow the strategy described in Option 1A.

The Dungeness spring/summer chinook is a native[4], wild stock (WDF et al. 1993) which exhibits desirable traits of early return timing. It is in close geographic proximity to the Elwha which would suggest greater adaptability to the Elwha than non-proximate stock, and it lies within the same fish disease management zone as the Elwha drainage, which would facilitate future interbasin transfer of fish or eggs.

Unfortunately, this stock's current status is critical[5] (WDF et al. 1993), although it is the subject of long range recovery planning (Lichatowich 1992). Should it eventually recover to healthy levels, agreement with all management entities (State and tribal) would be needed prior to any stock transfer. Further, identifying appropriate brood stock for transfer may be difficult because of uncertainty over chinook return timing and spawner distribution in the Dungeness basin.

Option 3: Import Dungeness River stock from WDF Hoodsport Hatchery. This option entails outplanting the WDF Hoodsport Hatchery stock (southern Hood Canal) above RM 34. The Hoodsport stock has several desirable traits in that it originated from the Dungeness River and it is discreetly maintained at the Hoodsport Hatchery with an annual take of 50,000 eggs, so it is potentially available in the near-term for outplanting in the upper Elwha. However, it has hatchery influence, having been cultured at both the Hoodsport and Soleduc hatcheries. Importation from Hood Canal would likely require additional disease screening compared to transfer of eggs or fish from the Dungeness River basin.

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[4] An indigenous stock that has not been substantially impacted by genetic interactions with non-native stocks or by other factors.

[5] Production levels are so low that permanent damage to the stock is likely or has already occurred.

E. SUMMER/FALL CHINOOK SALMON

Elwha Stock Status. Summer/fall chinook are a native stock of composite[6] production associated with both fish facilities in the lower river (WDF and LET). Stock status is healthy[7] (WDF et al. 1993).

Option 1: Outplant juvenile Elwha stock. This strategy involves collecting eggs across the range of the Elwha chinook spawning timing, then outplanting spring subyearlings in like manner as Option 1A for spring chinook (Table G-3). Outplanting would accelerate the process of introducing the stock to the upper basin (as opposed to natural recolonization) and would occur between RM 5 and RM 34 (the assumed historic range of Elwha summer/fall chinook). The rationale for a spring subyearling outplant is the same as described under Option 1A for spring chinook. Given the healthy condition of this stock and the existence of hatchery production in the lower river, brood should be available after removal of the dams provided necessary capital improvements to fish facilities are made as described in COSTS.

Option 2: Rely on natural recolonization. In the absence of other measures to introduce summer/fall chinook in the upper river basin, the lower river stock would gradually penetrate the watershed over an extended time period. In the Skykomish River, for example, adult chinook were introduced to 90 stream miles of previously inaccessible habitat above Sunset Falls and peak returns (to a trap at Sunset Falls) occurred approximately 15 years later (Seiler 1991).

F. COHO SALMON

Elwha Stock Status. Coho salmon are a mixed stock of composite production associated with hatchery facilities in the lower Elwha River. Status of the stock is healthy (WDF et al. 1993). Hatchery production began with Dungeness and Elwha parents at the WDF facility, but occurs now only at the LET facility.

Option 1: Outplant Elwha stock juveniles. This option entails outplanting Elwha fingerlings above RM 16 beginning one year prior to complete dam removal (Table G-3), allowing for one year of freshwater rearing before emigration. The existing Elwha stock should be readily available for outplanting given its healthy status and the existing hatchery program. This stock is also the closest to native Elwha stock.

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[6] Sustained by both wild and artificial production.

[7] Production is consistent with available habitat.

Case studies suggest that a fingerling outplant program would be an effective reintroduction measure. WDF has released juvenile coho at similar time and size and observed relatively high survival to smolt. Subyearling plants were used to successfully introduce coho in barren habitat in the upper Skykomish River above Sunset Falls. Full productive potential was realized within 10 years (Seiler 1991). One fingerling outplant in the upper Elwha River exhibited high survival to smolt (an estimated 30%, Wunderlich et al. 1989). To reduce predation on juvenile pink and chum salmon, coho outplanting would occur above RM 16 (upper limit of pink and chum outplanting) because coho are important predators of pink and chum.

Fingerling coho releases would significantly reduce outplanting costs compared to yearling releases, as all coho outplanting would be aerial (above RM 16). Assuming 10% survival from fingerling to yearling, outplanting costs would be less than a third for fingerlings versus yearlings at the same seeding rate.

Fingerling coho would be scatter planted, as opposed to mass planted or released in conditioning ponds as for other species, to improve survival. Scatter planting is preferable to mass planting of fingerling coho given their yearlong freshwater residency and strongly territorial behavior (Salo and Bayliff 1958). Outplanting coho in excess of carrying capacity would result in no greater production and could adversely affect rearing and survival of other species (Mason 1976).

Fingerling coho would be planted at approximately one-half the estimated carrying capacity of available habitat in the river basin (Table G-3). This rate has been used by WDF for coho fry outplanting. Seeding at less than potential full seeding capacity is appropriate because of the impracticality of outplanting juvenile coho in all habitat available in the basin. Smolt releases at the LET Hatchery would be delayed until late May to reduce predation on emigrating pink and chum salmon.

Option 2: Rely on natural recolonization. In the absence of other measures to reintroduce coho in the upper basin, natural recolonization of the upper river would occur over an uncertain time period once access to the upper river is reestablished.

G. PINK SALMON

Elwha Stock Status. Pink salmon are considered a native, wild stock whose status is critical based on chronically low escapements over the past decade (only four individuals were observed in extensive surveys in 1989 compared to estimates of over a thousand in the early 1970s) (WDF et al. 1993).

Option 1: Enhance existing Elwha stock. This option consists of intensive status evaluation for two return years followed by brood development and outplanting, if suitable brood exists. Chronically low escapements cast doubt on there being sufficient brood available. The existing lower river run may be non-viable and consist only of Dungeness River strays, so the presence of an adequate genetic base to restore a run is questionable. Optimally, at least several hundred breeding individuals are desirable to avoid long-term problems of inbreeding and the loss of genetic variability (Waples 1991).

Despite chronically low escapements, further spawner survey is proposed. Pink salmon populations can rebound quickly due to their short (two year) life cycle, as evidenced by case study of the upper Skykomish River. With access to new habitat in the upper south fork Skykomish above Sunset Falls in 1959, the initial pink escapement was only 150 individuals and escapements remained low until 1981, when over 2,000 fish returned. Pink numbers then trebled over each of the next two cycles and escapement exceeded 20,000 by 1985 (Seiler 1991).

The outplanting strategy shown in Table G-3 consists of mass outplanting of smolts at densities within the possible carrying capacity of the lower river. Mass outplanting is recommended to swamp pink salmon predators, which can significantly limit juvenile pink populations. Initial incubation and rearing would occur at the LET Hatchery, but final incubation and rearing would occur at satellite facilities below RM 16.

Option 2: Import upper river Dungeness stock. If Option 1 fails, upper river Dungeness stock would be imported, if available. The Dungeness River pink salmon run has several desirable traits as a donor stock for the Elwha. It is a native, wild stock (WDF et al. 1993) which has an "upper river" component that returns early (late July) and spawns high in the system (spawning peaks at the end of August) (Lichatowich 1992). Upper river spawning would encourage colonization throughout available habitat in the Elwha. Early return and upper river spawning would minimize the risk of adversely affecting any remnant Elwha pink run, as historical spawner survey data for the Elwha indicate a late September to October spawn timing (WDF spawner survey data base), which is considerably later than upriver Dungeness stock. The Dungeness River is also geographically close to the Elwha, which would facilitate the transfer of fish or eggs. It also lies within the same fish disease management zone as the Elwha drainage, which could facilitate future interbasin transfer of fish or eggs.

The upper river Dungeness pink stock is a potential long-term prospect as a donor source for the Elwha. Unfortunately, this stock is presently considered depressed due to chronically low escapements (WDF et al. 1993) and is itself the subject of restoration planning (Lichatowich 1992). Should the run rebound, agreement on stock transfer would need to be reached with management entities (State and tribal) before export to the Elwha could occur, including concurrence on threshold levels of escapement before removal.

Option 3: Import Finch Creek Stock. Pursued if both Options 1 and 2 fail, this option consists of importing pink salmon stock from the WDF Finch Creek Hatchery program in Hood Canal. The Finch Creek stock originated from the Dungeness in the 1950s and has been maintained without infusion of outside stocks since. The Finch Creek stock is now considered genetically distinct from the Dungeness based on electrophoretic analysis. Hatchery egg takes are relatively stable and approach 2 million. A portion of the Finch Creek stock would be moved to the Elwha system for hatchery culture and outplanting (as noted under option 1). More stringent fish disease transfer restrictions could be required because of its geographic location.

H. CHUM SALMON

Elwha Stock Status. Chum salmon are considered a native, wild stock whose status is unknown (WDF et al. 1993). The LET hatchery produced non-native chum (principally Walcott Slough from Hood Canal), but the program was discontinued about 1986.

Option 1: Enhance existing Elwha stock. Following additional assessment that began in 1993, Elwha stock would be augmented and outplanted as indicated in Table G-3. Additional assessment would include spawner surveys for one cycle (four years) to evaluate the availability of chum for brood development. Spawner surveys would include electrophoretic sampling of spawned fish to assess the degree the existing stock was influenced by hatchery releases of non-native stock. Samples would be collected and stored over more than one season if needed to meet sampling requirements. Limited electrophoretic sampling in 1985 suggested that remnant Elwha chum were similar to Walcott Slough stock, but additional sampling over the entire run would be desirable to firmly establish what native genetic material is left.

Additional assessment of chum entry timing is also underway in an attempt to isolate differences in entry timing as it relates to the presence of native and non-native stock. Lower river habitat survey would be conducted to develop habitat improvement measures to stabilize/enhance existing stock prior to dam removal.

Brood collection would focus on any identifiable native component as a first priority. Initial incubation and rearing would occur at the LET Hatchery, but final incubation and rearing would occur at satellite facilities below RM 16, or in appropriate locations for remote site incubators (Manuel et al. 1991). Table G-3 shows target release numbers, time, and size, based on habitat carrying capacity at time and size of release.

Option 2: Rely on natural recolonization. Once access is reestablished, natural recolonization of the river below RM 16 would occur over an uncertain time period.

Option 3: Import a nearby Strait of Juan de Fuca stock. Under this option, the status and availability of potential donor stocks in nearby Strait streams would be assessed. If option 1 does not meet expectations and brood is available, a brood run would be developed in the Elwha as outlined under Option 1. Nearby stocks in the Lyre and Pysht rivers would be assessed for availability. Agreement on stock transfer would need to be reached with management entities before export to the Elwha system could occur.

I. SOCKEYE SALMON

Elwha Stock Status. The native lower river stock does not exist because Elwha Dam blocks access to Lake Sutherland (Figure G-1), which is needed to complete the freshwater phase of the sockeye salmon life cycle.

Option 1A: Develop a native run from Lake Sutherland kokanee. This option consists of enhancing the anadromous component of Lake Sutherland kokanee, assuming it retains a significant element of the original Elwha sockeye. Kokanee (non-anadromous sockeye) may retain the genetic drive for anadromous behavior over a number of generations. This phenomenon underpins the draft recovery plan for Snake River sockeye salmon in the Stanley Lakes basin of Idaho (Bevan et al. 1992). Kokanee are known to produce anadromous offspring which, through capture and captive rearing, could produce offspring for outplanting in the nursery lake. In this way, the anadromous component of the kokanee population would be augmented (Bevan et al. 1992). However, the success of captive rearing sockeye is uncertain and the initial results of the Snake River sockeye recovery effort (the first attempt to captive rear sockeye) are not yet known.

In the Elwha basin, stimulating anadromous behavior in kokanee is further complicated by the uncertain parentage of the kokanee population. Lake Sutherland kokanee may be derived from Elwha sockeye, landlocked since closure of Elwha Dam in 1912. However, WDW hatchery records indicate release of non-native (Lake Whatcom stock) kokanee in Lake Sutherland from at least 1944 until 1964. The Lake Sutherland kokanee population has sustained itself to present, but the influence of non-native kokanee releases on the native kokanee/sockeye population is uncertain.

The assumptions of Elwha sockeye parentage and ability to stimulate anadromy may not be met, so the following stepped approach would be pursued in tandem with Option 1B:

1. Refine spawning and rearing capacity estimates for Lake Sutherland through additional habitat surveys and profiles of the existing fish community (performed in tandem with Option 1B).

2. Evaluate the anadromous component of the existing kokanee population by trapping smolts at the outlet weir of Lake Sutherland. Evaluation would consist of measuring smoltification indices (ATPase, saltwater challenge) and comparing smolts to Lake Whatcom kokanee stock by means of electrophoresis.

3. If smolts emigrate in sufficient numbers, captive rear them and return their progeny to Lake Sutherland over one or more cycles prior to dam removal.

4. Remove outlet weir to Lake Sutherland when safe downstream passage is assured after removal of Elwha Dam.

Option 1B: Import an outside stock. If Option 1A fails, sockeye fingerlings from a donor stock would be released in Lake Sutherland beginning one year prior to Elwha Dam removal at carrying capacities consistent with available habitat as identified in Option 1A. Table G-3 shows a preliminary release strategy. The lake's outlet weir would be removed after removal of Elwha Dam.

Screening for potential donor stocks would occur concurrently with Option 1A. Criteria for a donor stock would include (1) lakeshore spawning trait, (2) adaptation to a low elevation, near-saltwater lake basin with similar outlet orientation as Lake Sutherland, and (3) an acceptable fish health profile for transfer into the Elwha River basin.

III. COSTS

Capital costs to support the fish restoration plan total approximately $4.1 million for improvements in the Elwha River's LET fish facility and WDF fish facility, plus outplanting and evaluation equipment (Table G-4). Annual operation and maintenance costs (Table G-5) including fish stock assessment, brood development and maintenance, outplanting, and project evaluation and management total approximately $5.3 million for the fish restoration period (1994 to 2012). Hatchery support and outplanting costs assume maximum fish production under any option at target outplanting levels (Table G-3).

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Table G-1. Summary of options for restoring Elwha River anadromous fish. Options are in priority order.

Option	Description
Winter Steelhead	
1A	Develop a native run from the upper-river rainbow trout population.
1B	Rely on upper-river rainbow trout population to re-establish run.
2	Augment late-run, lower-river stock.
3	Import a suitable Olympic Peninsula stock.
4	Rely on natural recolonization by lower-river stock.
Summer steelhead	
1A	Develop a native run from the upper-river rainbow trout population.
1B	Rely on the upper-river rainbow trout population to re-establish run.
2	Rely on natural recolonization by lower-river stock.
3	Import a suitable West Olympic Peninsula stock.
4	Augment native component of lower-river stock.
Sea-run Cutthroat	
1	Rely on natural recolonization.
Sea-run Native Char	
1	Rely on natural recolonization.
Spring Chinook Salmon	
1A	Outplant juvenile summer/fall Elwha stock and rely on natural processes to establish an early run.
1B	Augment and outplant early portion of Elwha chinook run.
2	Import Dungeness River stock from Dungeness River basin.
3	Import Dungeness River stock from WDF Hoodsport Hatchery.
Summer/Fall Chinook Salmon	
1	Outplant juvenile Elwha stock.
2	Rely on natural recolonization.
Coho Salmon	
1	Outplant juvenile Elwha stock.
2	Rely on natural recolonization.
Pink Salmon	
1	Augment existing Elwha stock.
2	Import upper-river Dungeness stock.
3	Import Finch Creek stock.

Table G-1. Continued.

Option	Description
Chum Salmon	
1	Augment existing Elwha stock.
2	Rely on natural recolonization.
3	Import a nearby Strait of Juan de Fuca stock.
Sockeye Salmon	
1A	Develop a native run from Lake Sutherland kokanee.
1B	Import an outside stock.

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Table G-2. Timeline for restoration of Elwha River anadromous fish stocks showing the principal expected annual activity for each restoration option. Abbreviations: S - stock-status assessment; B - brood development; O - outplanting; E - evaluation of adult return.

Fish stock/ restoration option	Year																					
		1995	|——	——	|[a]		2000					2005					2010					2015
Winter steelhead[a]																						
1A	B	B	B	B	B	O	O	OE	OE	OE	OE	E	E	E								
1B	S	S	S	S	S	——— Natural recolonization ———>																
2	S	S	B	B	B	O	O	OE	OE	OE	OE	E	E	E								
3	S	S	S	B	B	B	O	O	OE	OE	OE	OE	E	E	E							
4						——— Natural recolonization ———>																
Summer steelhead[a]																						
1A	B	B	B	B	B	O	O	OE	OE	OE	OE	E	E	E								
1B	S	S	S	S	S	——— Natural recolonization ———>																
2						——— Natural recolonization ———>																
3	S	S	S	B	B	B	B	B	B	B	B	O	O	OE	E	E	E	E				
4	S	S	B	B	B	O	O	OE	OE	OE	OE	E	E	E								
Sea-run cutthroat																						
1						——— Natural recolonization ———>																
Sea-run native char																						
1						——— Natural recolonization ———>																
Spring chinook																						
1A						O	O	O	OE	OE	OE	OE	OE	E	E	E	E					
1B	S	S	B	B	B	B	O	O	O	OE	OE	OE	OE	OE	E	E	E	E				
2							O	O	O	OE	OE	OE	OE	OE	E	E	E	E				
3							O	O	O	OE	OE	OE	OE	OE	E	E	E	E				

Table G-2. Continued.

Fish stock/ restoration option	Year																					
		1995	|—	—	—|[A]		2000					2005					2010					2015
Summer/fall chinook																						
1						O	O	O	OE	OE	OE	OE	OE	E	E	E	E					
2						———— Natural recolonization ————>																
Coho[c]																						
1					O	O	OE	OE	OE	OE	OE	E	E	E								
2						———— Natural recolonization ————>																
Pink																						
1		S		B		B		O		OE		OE		OE		E						
2		B		B		B		O		OE		OE		OE		E						
3								O		OE		OE		OE		E						
Chum																						
1	S	S	S	B	B	B	B	O	O	O	OE	OE	OE	OE	OE	E	E	E	E			
2						———— Natural recolonization ————>																
3	S	S	S	S	B	B	B	B	O	O	O	OE	OE	OE	OE	E	E	E	E			
Sockeye																						
1A	S	S	S	B	B	B	O	O	O	OE	OE	OE	E	E	E							
1B					O	O	O	OE	OE	OE	E	E	E									

[A] Dam removal and fish passage restoration (1996-1998).
[B] Fry outplanting may occur two years before complete dam removal depending on stock availability.
[c] Fry outplanting may occur one year before complete dam removal.

Table G-3. Proposed anadromous fish outplanting program.

Stock	Outplant location	Outplant time/size	Outplant number (target)	Potential full-seeding capacity	Fish facility
Winter steelhead	RM 5-34	Mid-March (9/lb) pre-smolt	145,000	145,000 smolts	LET
Summer steelhead	Above RM 34	Mid-March (9/lb) pre-smolt	35,000	35,000 smolts	LET
Spring chinook	Above RM 34	Early May (90/lb) pre-smolt	100,000	70,000-190,000 fingerlings	WDF or LET[a]
Summer/fall chinook	RM 5-34	Early May (90/lb) pre-smolt	400,000	370,000-560,000 fingerlings	WDF
Coho	Above RM 16	Mid-March (500/lb) fingerling	900,000	1,800,000 fingerlings	LET
Pink	RM 5-16	Spring (1125/lb) outmigrant	315,000	200,000-12,000,000 outmigrants	LET or WDF[a]
Chum	RM 5-16	Spring (450/lb) outmigrant	630,000	650,000-4,200,00 outmigrants	LET
Sockeye	Lake Sutherland	Spring (450/lb)	190,000 lake release	95,000-190,000 fingerlings	LET

[a] Depending on fish restoration option.

Table G-4. Capital costs for fishery activities (in 1993 dollars).

Item	Cost ($1000s)
Tribal Fish-Production Facility	
Increased water supply	600
Upgraded incubation facilities	175
Satellite facilities for pink and chum salmon	12
Expanded support facilities	295
WDF Fish-Production Facility	
Improved water supply, incubation, early rearing, pollution abatement, and adult collection facilities	2,921
Outplanting and Evaluation Equipment	
Boat	10
Truck	25
Distribution tank	3
Miscellaneous	20
Total	4,061

Table G-5. Operation and maintenance costs for fisheries activities (in 1993 dollars).

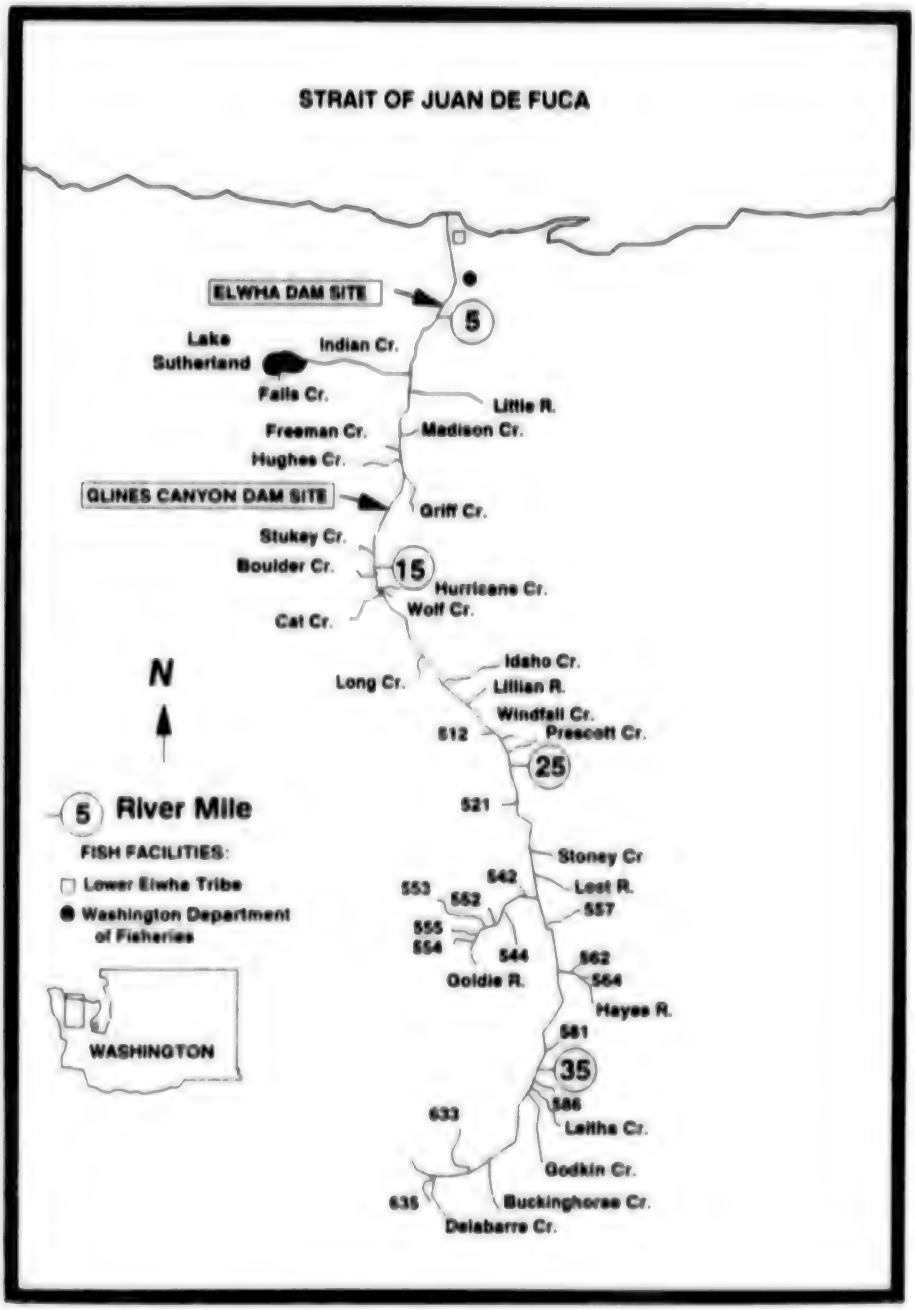
Year	Cost ($1000s)					
	Stock assess.	Hatchery support[a]	Outplanting[b]		Project eval.[c]	Total
			Air	Ground		
1994	390	116			84	590
1995	226	117			84	427
1996	222	121			84	428
1997	8	128			84	220
1998		133	7	1	84	225
1999		155	112	11	84	363
2000		154	112	11	84	361
2001		155	112	11	99	378
2002		154	112	11	99	376
2003		155	112	11	99	378
2004		154	112	11	99	376
2005		149	105	11	99	365
2006		55	45	3	99	202
2007		35	32	1	99	166
2008		6	0	1	99	106
2009					99	99
2010					99	99
2011					99	99
2012					84	84
Total:	846	1,788	860	85	1,763	5,343

[a] Hatchery brood development and maintenance at $3.18/lb of fish produced plus $1,665 annually to mark LET steelhead production (1994-2007) during the winter steelhead brood-development period (Option 2).

[b] Outplanting at $3.65/lb by air (helicopter) and $0.65/lb for ground distribution. Proportions outplanted by air: all spring chinook, coho, and summer steelhead, and 55% of fall chinook and winter steelhead.

[c] Evaluation costs consist of personnel (1 full-time biologist at $35,000/yr and 3 half-time biologists at $25,000/yr annually); O&M for outplanting and evaluation equipment at 20% of initial capital cost (Table G-4) annually; and helicopter service (30 hr/yr at $500/hr) for spawner survey during chinook and steelhead return years.

Figure G-1. Lineal extent of anadromous salmonid habitat in the Elwha River basin following removal of the Elwha and Glines Canyon dams.



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APPENDIX H

HABITAT RESTORATION PLAN

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APPENDIX H

HABITAT RESTORATION PLAN

I. GLINES CANYON PROJECT AREA

A. RESTORATION OBJECTIVES

Restoration of the Elwha River ecosystem and disturbed habitat of the Glines Canyon Project involves several issues and concerns. The National Park Service (NPS) is mandated to conserve and protect native species of plants and animals and perpetuate natural processes. Resources unique to Olympic National Park, or those that are limited in their extent on the Olympic Peninsula due to human-induced changes (such as old-growth forest) are of particular concern. While anadromous fish restoration is a primary objective of the overall dam removal proposal, the NPS must adopt a landscape- or ecosystem-level approach in developing restoration objectives, plans, design standards, and the actual methodologies that might be employed. Over time, the restored area would attain characteristics of the surrounding area now managed as wilderness and could eventually be proposed for inclusion in wilderness. The restoration process must be carefully designed to meet the objectives of full ecosystem restoration and perpetuation of natural processes and should not preclude the opportunity for eventual wilderness designation. Primary NPS restoration objectives are:

1. Restore the ecosystem to a close approximation of the conditions and attributes found prior to dam construction and valley inundation.

2. Reconstruct, to the maximum extent possible, natural contours and major landform features within the inundated area of the reservoir, including a natural appearance to slopes (steepness, aspect), major topographic features such as hills, escarpments, gullies, and terraces.

3. Reestablish the river channel in a manner to maximize natural hydrological features including variable channel width and depth, geometry, sinuosity, and proportion of pools and riffles, while permitting the river to regain "dynamic equilibrium" within the floodplain.

4. Restore sediment and water flow regimes, meaning daily and seasonal variations in flow and sediment loading, that mimic natural annual or decadal patterns caused by flood and drought.

5. Replant native riparian and upland vegetation within the reservoir area and along approximately three miles of restored powerline corridors. Revegetate the area to

provide for erosion control while replicating representative vegetation community types, species composition, plant density, spacing, and overall structure. Minimize invasion by exotic plant species.

6. Create aquatic habitat within the restored river channel to both enhance fish restoration efforts by providing rearing habitat and resting areas, and assist prompt recolonization by invertebrate fauna.

7. Protect designated wildlife and plant species and their critical habitats during dam removal and construction activities.

8. Permit the area, over time, to be subjected to natural processes, disturbances, and environmental perturbations such as floods, windstorms, natural (lightning) fires, native forest insects and disease, and other similar events.

9. Thoroughly document and systematically monitor all phases of restoration to permit future evaluation of the strategies and techniques used. Documentation will include a comprehensive project history.

10. Encourage independent research of this restoration project and facilitate communication of information and findings with other agencies and institutions.

The timing of habitat restoration is dependent on the dam removal and sediment management option ultimately selected. However, preliminary activities are necessary prior to dam removal to prepare for the restoration effort.

B. RESTORATION SCHEDULE

2-3 Years Prior to Dam Removal

-- Complete information gathering and identified research.

-- Conduct empirical growing trials to identify candidate revegetation species and their performance in lake silts.

-- Initiate seed and cone collection; sort and clean.

-- Determine most cost-effective propagation methods for selected plant materials.

-- Continue compilation of restoration bibliography.

Upon Approval of Restoration Funding

-- Initiate aggressive control program of exotic plants.

-- Begin large scale plant material production.

-- Begin collection and storage of large woody debris.

-- Convert sites at Sweet's Field and Elwha Ranger Station for plant propagation and materials storage.

-- Initiate contracting with other non-NPS propagation sources (Soil Conservation Service Plant Material Centers, U.S. Forest Service, industrial growers).

-- Install seed traps within Elwha drainage to provide passive seed collection.

-- Begin formal documentation of restoration sequence.

During Initial Dam Removal/Sediment Stabilization Phase

-- Transport large woody debris to identified in-lake storage sites.

-- Follow reservoir dewatering with hydroseeding.

-- Use helicopter hydroseeding in inaccessible areas.

-- Remove powerlines.

-- Treat sensitive or unstable areas with biotechnical slope stabilization techniques.

-- Install instream habitat improvement structures.

-- Remove unneeded facilities from lake shore areas; rehabilitate sites.

-- Document activities.

1-3 Years Following Dam Removal

-- Intensively plant selected revegetation species within each habitat type.

-- Monitor recolonization of area by wildlife.

-- Augment instream invertebrate recovery with additions of organic litter.

-- Continue monitoring and control of exotic species.

-- Document activities.

Year 4 Following Dam Removal and Continuing

-- Repair areas where revegetation has failed.

-- Continue control of exotic plants.

-- Restore construction and staging areas.

-- Restore or repair NPS infrastructure and facilities.

-- Monitor and document recovery.

C. FUNDING REQUIREMENTS

Glines Canyon Project habitat restoration (1993 dollars).

Prior to Dam Removal	
Information gathering/research	$75,000
Growing trials	25,000
Seed and cone collection, processing	80,000
Research propagation methods, contracting	12,000
Restoration bibliography	5,000
Total	197,000

Upon Approval of Restoration Plan and Funding

Control exotic plants	40,000
Plant materials production	250,000
Collect/store large woody debris	40,000
Convert NPS sites for propagation activities	170,000
Contracting for plant materials propagation	250,000
Install seed traps	8,000
Total	758,000

Initial Dam Removal Phase

Transport/placement large woody debris	75,000
Hydroseeding, initial revegetation	500,000
Helicopter overseeding	60,000
Biotechnical slope stabilization	450,000
In-stream structures	150,000
Remove unneeded public facilities/rehab sites	20,000
Total	1,255,000

1-3 Years Following Dam Removal

Plant trees and other native vegetation	300,000
Monitor wildlife recolonization	20,000
Augment in-stream invertebrate recovery	20,000
Control exotic plants	30,000
Total	370,000

Year 4 and Continuing

Follow-up revegetation in failure areas	150,000
Control exotic plants	20,000
Restore disturbed sites used during construction	80,000
Repair NPS infrastructure/facilities	------
Monitoring/Documentation (Vegetation only)	15,000
Total	+265,000
Subtotal	2,845,500
Contingency (25%)	711,250
Total	3,556,750

II. ELWHA PROJECT AREA

A. RESTORATION OBJECTIVES

The primary objective of the habitat restoration plan for the Elwha Project lands and appurtenant facilities is to restore and protect the ecosystem, including the anadromous fish runs that were affected by the construction of the Elwha Project. To achieve this objective, the plan would include measures to restore the biological, hydrologic and physical processes that occurred prior to the construction of the Project.

The Elwha Project lands and appurtenant facilities total about 1000 acres and include about 265 acres presently covered by Lake Aldwell, 675 acres of second growth forest land bordering the reservoir, 70 acres of riparian bottom lands located where the Elwha River and Indian Creek enter Lake Aldwell, and about 40 acres that have been developed or altered for roads, parking, and project facilities.

The following guidelines would be used to direct the habitat restoration efforts for the Elwha Project lands: (1) restore the biological, hydrologic, and physical processes while taking into account water supply and flood control objectives; (2) restore the Lake Aldwell area to pre-dam conditions and attributes, but with the allowance for the preservation of wetlands that have developed within the Lake Aldwell delta; (3) re-establish the river channel dynamics, including meander and pool-run-riffle composition; (4) restore the anadromous fish spawning, rearing and holding habitat; (5) restore fish passage to Indian Creek and Lake Sutherland; (6) use native or sterile plant species in the reseeding or revegetation program; and (7) control or eliminate noxious exotic species as necessary. In addition, a monitoring program should be included in the restoration plan to evaluate and document the effectiveness of the management prescriptions and to serve as the basis for implementing corrective measures.

To facilitate the discussion of habitat restoration measures that would be implemented for specific locations within the project boundary and the integration of the habitat restoration plan with the specific management plans required under Section 3(c)(3) of P.L. 102-495, the Elwha Project lands have been separated into the following units: (1) the Lake Aldwell lakebed; (2) the river channel and adjacent lands both upstream from the Lake Aldwell and downstream from Elwha Dam; (3) the riparian bottom lands in the vicinity of where Indian Creek and the Elwha River enter Lake Aldwell and downstream from Elwha Dam; (4) the forest lands bordering the lakebed; and (5) disturbed areas, including but not limited to roads, parking lots, project facilities, and some forest lands "outside" the river corridor.

1. **Lake Aldwell Lakebed.** The focus of the habitat restoration plan for the Elwha Project lands would be on the Lake Aldwell lakebed because of the major changes that have occurred to the pre-dam habitat as a result of being flooded for 80 years, and because the habitat restoration objectives must be integrated with water supply and flood control objectives. The need to protect downstream fish and wildlife resources, water supplies, and human property from the increased risk of flooding that could result from the release and transport of accumulated sediments may have a major bearing on the specific habitat restoration measures that could be implemented. The quantity of sediment that needs to be stabilized within the reservoir zone, along with the acreage that would be needed for this purpose is still being evaluated. Consequently, a single definitive plan for habitat restoration cannot be developed at this time. It is possible, however, to describe general plans for restoring habitat over a range of sediment management options and to update these plans as water supply and flood control plans are refined.

Sediment management options that involve the permanent retention of most of the sediments within the lakebed would limit the scope of habitat restoration within the Lake Aldwell lakebed. These options would generally require the implementation of artificial measures such as restricting Indian Creek and the Elwha River to an engineered channel and the mounding or benching of large quantities of reservoir sediments.

The armoring of the reconstructed channel slope, using either quarry rock or material dredged from the Lake Aldwell delta, is one of the sediment management options being considered. While channel armoring would prevent the river from cutting into the sediment disposal areas, it would also limit the restoration of the dynamic physical and hydraulic processes associated with river meander (e.g., formation of side channels, pools, and backwaters). Since the constructed channel slopes could be relatively gradual (4:1, horizontal:vertical), a "failure" of the armoring should not result in massive bank slumping and the subsequent release of unacceptable quantities of sediment. As vegetation becomes established and adds additional stability to the channel slope, the need for the channel armoring would lessen. From a natural process perspective if channel armoring is determined to be necessary, it would be desirable to design the armoring to gradually "fail" overtime through the use of smaller rock or reducing the thickness of the armored layer.

The establishment of vegetation along the channel slopes would be an important part of habitat restoration efforts. Large trees along the channel banks are needed as a future source of large wood debris to the stream to provide habitat diversity. Since it will take many years before large trees become established, measures to accelerate the process should be implemented. Suitable soil removed during the sediment management process should be stockpiled for later use to spread over and between the armor rock layer. This area should subsequently be seeded and planted with a combination of nitrogen fixing and pioneering species (e.g., red alder, willow, black cottonwood, and herbs and forbs). Hydromulching and the placement of erosion control matting may be needed to facilitate revegetation.

The retention option would also involve the benching of up to 4 million cubic yards of sediments over a 50 to 100 acre area within the southern half of the lakebed. To retain the majority of the sediments within this area, sediment benches up to 35 feet in thickness would be created. Redeposited delta sediments, consisting of a combination of sand, gravel, cobbles, and organic material, are expected to support early successional species (grasses, sedges, red alder, cottonwood, and willow) without the need for soil amendments. In contrast, a three to six foot layer of fine sediment (silt and clay) presently covers the non-delta portion of the reservoir bottom. An analysis of clay and silt taken from Lake Mills (Aldwell sediments are expected to be similar) by the National Park Service indicates that this material is low in fertility and would provide a poor growing medium unless ample site preparation measures are included. In addition, this material becomes resistant or impervious to water penetration when dry and may preclude the establishment of shrubs and trees if the layer becomes more than a few feet thick. Over 1 million cubic yards of silt and clay may need to be retained and may require up to 50 acres. A hydromulch mixture of water, fiber mulch, nutrients, tackifier, sterile fast growing grass, native pioneer species of grasses, and forbes may be sufficient to establish non-woody vegetation. Significant site preparation, including the addition of soil amendments would likely be necessary to establish pioneer shrub and tree species. The development of an emergent wetland may be a viable option if it is not feasible to reestablish woody vegetation over the silt/ clay disposal sites.

Since no silt/clay relocation and disposal would occur in the northern half of the lakebed, the potential problem of dealing with a thick layer of silt and clay should be reduced, but would likely still involve some problem associated with poor fertility and permeability. Limited access by heavy equipment because of the steep terrain may limit the acreage on which soil amendment measures could used, if needed. The application of hydromulching and erosion control blankets, however, could proceed concurrently with the lowering of the reservoir level. Up to 200 acres within the Lake Aldwell lakebed would require revegetation.

Specific plans for restoring aquatic habitat have yet to be developed, but must be integrated with the measures being developed to control sediments. Habitat diversity is important to the overall productivity of the Elwha River. Restoring the natural character and attributes of the river would involve replacing inchannel structure (i.e., boulders and large woody debris such as trees and root wads) and providing the necessary conditions for the formation of undercut banks, channel meander, backwater areas, side channels, and a representative proportion of pool, riffles and runs. Additionally, the reservoir for 80 years has blocked the transport of gravel that is necessary for the maintenance of downstream spawning habitat. The feasibility of separating appropriate sized substrate (e.g., 0.5 to 3.5 inch diameter) from the sediments to be relocated and disposed needs to be evaluated for potential use in rehabilitating degraded fish spawning habitat. Impacted or degraded habitat both within and downstream from Lake Aldwell would be potential locations to consider for gravel augmentation. Options to be evaluated include the direct placement of spawning gravel at suitable locations (proper gradient and hydraulic) or the stockpiling of suitable material within the channel for the high flows to naturally transport and distribute. Cost estimates for these options will be developed.

2. **The Elwha River Channel Outside the Reservoir Zone.** Within the project boundary, the Elwha River channel and adjacent riparian lands, located both upstream from Lake Aldwell (about 2,000 feet along one bank) and downstream from Elwha Dam (about 2,000 feet along both banks), are relatively undisturbed so would require a minimal level of restoration effort. Habitat restoration measures would probably be limited to the elimination and revegetation of the transmission line access road following the removal of the transmission lines and poles. It is anticipated that the future management of these project lands would be to preserve these areas in their natural state.

3. **Riparian Bottomlands at the Confluence of Indian Creek and the Elwha River.** This area is composed of mixed coniferous/deciduous forests, coniferous forests, palustrine forests, emergent wetlands, and Indian Creek. The emphasis for this area would be to preserve the diversity and the value of the existing habitats. The lowering and removal of the reservoir and the implementation of sediment management measures (e.g., channel relocation and armoring, and berm construction) have the potential to impact this area. The removal of the reservoir may lower the water table and change the character of the existing wetlands. Also, the hydrology of the wetlands could be impacted by both the modification of the Elwha River and Indian Creek channels or the construction of sediment retention berms, if these measures are found to be necessary for controlling the erosion of the delta sediments.

Instead of constructing a heavily armored channel to pass the flow in Indian Creek through the delta sediments, other more natural and biologically desirable options will be evaluated. For example, the construction of a number of small check dams using large woody material may provide the necessary hydraulic grade control to prevent channel downcutting while still providing the desired conditions for maintaining the existing wetlands. Additionally, the aquatic habitat within a meandering channel with numerous drops and pools, runs, and riffles should be much more productive than a straight, heavily armored channel designed primarily for the transport of water. The estimated cost for constructing small log and riprap check dams about every 40 feet along the forming channel is about $400,000 (FERC 1993).

4. Forest lands bordering Lake Aldwell. The area bordering Lake Aldwell consists primarily of second growth forest and includes a combination of coniferous, deciduous, and mixed forests. Much of this land is steep and is prone to erosion and landslides, if the vegetation is removed. Because of the potential of this area to seriously impact down slope habitats including the Elwha River, a preservation/conservation management objective is recommended. No habitat restoration measures have been identified. Not all of the forest land is on steep slopes and would be available for such purposes as described in Section 3(c)(3) of P.L. 102-495.

5. Disturbed Project Lands. About 40 acres of land have been disturbed as a result of project construction (dams, powerhouses, penstocks, access roads, parking, transmission corridor, and support facilities) and other developments, such as the Elwha Resort and former gravel pit. While the disturbed areas could be improved for wildlife, there is an expectation that some of these lands would be maintained in their present condition or developed for other purposes. Possible options include the location of public education and interpretation facilities either jointly or separately by the U.S. Fish and Wildlife Service, the National Park Service and the Lower Klallam Elwha Tribe, public access to the area, and development by the Tribe for cultural purposes and economic and residential development. The need for habitat restoration measures would depend largely on what development or land use decisions are made. Specific habitat restoration measures would be developed, as needed, but are assumed to be limited at this time.

B. RESTORATION SCHEDULE

It has been assumed that the habitat restoration schedule for the Elwha Project would be similar to the schedule described for the Glines Canyon Project (see above). These schedules will be further refined during the Environmental Impact Statement/advanced planning process to reflect the dam removal and sediment stabilization timetable.

C. FUNDING REQUIREMENTS

Elwha Project habitat restoration (1993 dollars).

Prior to Dam Removal

Growing trials	$5,000
Seed and cone collection, processing	45,000
Total	$50,000

Upon Approval of Restoration Plan and Funding

Control exotic plants	25,000
Plant material production	140,000
Collect/store large woody debris	40,000
Develop Elwha Project lands for propagation use	100,000
Contracting for plant materials propagation	140,000
Install seed traps	5,000
Total	450,000

Initial Dam Removal Phase

Transport/Placement of large woody debris	75,000
Hydroseeding	290,000
Helicopter overseeding	33,000
Biotechnical slope stabilization	250,000
In-stream structures	390,000
Total	1,038,000

1-3 Years Following Dam Removal

Plant trees and other native vegetation	165,000
Monitor wildlife recolonization	15,000
Augment in-stream invertebrate recovery	20,000
Control exotic plants	20,000
Total	220,000

Year 4 and Continuing

Follow-up revegetation in failure areas	83,000
Control exotic plants	15,000
Monitoring/Documentation (Vegetation only)	10,000
Total	108,000
Subtotal	1,866,000
Contingency (25%)	466,500

III. ADDITIONAL RESEARCH/INFORMATION NEEDS

1. Perform additional laboratory testing of fertility and physical properties of sediments, including percent organic material, cation and anion exchange, particle size analysis, and micro-nutrients.

2. Investigate and quantify soil and substrate profiles in riparian zones above and below present reservoir area.

3. Conduct empirical growing trials, both in a greenhouse and on-site, using lake sediments and candidate revegetation species with variable amendment and fertilization protocols.

4. Identify suitable candidate species of grasses, sedges, and herbs for hydroseeding. Test performance on fine lake silts.

5. Continue consultation with U.S. Forest Service Region 6 silviculture staff to develop recommendations and technical standards for conifer regeneration.

6. Evaluate new seed and cone collecting technologies such as Fandrich™ aerial rake. Develop helicopter assisted cone harvest rates for sites in Glines Canyon vicinity.

7. Investigation and evaluation of need for mychorrhizal inoculation and rhizospheric bacteria relative to successful tree establishment.

8. Evaluate potential for wind erosion of fine silt upon exposure.

9. Conduct surveys to verify current habitat use by sensitive and protected wildlife species. Determine seasonal movement patterns of area elk herds.

10. Conduct reconnaissance level surveys for amphibians, invertebrates, and other fauna under-represented in previous studies.

11. Map rare plant distribution and determine impacts to each population from alternative restoration scenarios.

12. Determine the quantity of hazardous material from creosoted power poles which will require disposal and determine handling procedures.

13. Investigate further and evaluate new bioengineering technologies for erosion control and soil stabilization (e.g., geotextiles, natural coir products, synthetic soil chemicals) and experimental revegetation techniques such as soil solarization. Provide for staff travel to view and critically evaluate demonstration projects.

14. Establish fixed photo-points for use in long-term monitoring and documentation.

15. Continue compilation of restoration bibliography.

Total	2,332,500

Table H-1. Lowland vascular plants of the Elwha River Valley.

Species	**Common Name**	**Notes**
Ferns and Fern Allies		
Adiantum pedatum var. *aleuticum*	Maidenhair fern	
Aspidotis densa	Aspidotis	ONP Rare
Athyrium filix-femina var. *cyclosporum*	Lady-fern	
Botrychium virginianum	Grape-fern	WNHP Monitor
Equisetum telmateia var. *braunii*	Giant horsetail	
Pityrogramma triangularis var. *triangularis*	Gold fern	ONP Rare
Polypodium glycyrrhiza	Licorice fern	**INDICATOR**
Polystichum imbricans ssp. *imbricans*	Imbricate sword fern	
Polystichum munitum	Sword-fern	**INDICATOR**
Pteridium aquilinum	Bracken	
Grasses, Sedges, and Rushes		
Agrostis exarata var. *exarata*	Bentgrass	
Bromus vulgaris	Columbia brome	
Carex amplifolia	Big-leaf sedge	
Carex hendersonii	Henderson's sedge	
Carex hystricina	Porcupine sedge	WNHP-listed Sensitive
Carex stipata var. *stipata*	Sawbeak sedge	
Cinna latifolia	Drooping woodreed	
Elymus glaucus var. *glaucus*	Blue wildrye	
Festuca occidentalis	Western fescue	**INDICATOR**
Festuca subulata	Bearded fescue	
Festuca subuliflora	Coast Range fescue	
Glyceria elata	Tall mannagrass	
Juncus effusus	Common rush	
Koelaria cristata	Junegrass	
Luzula spp.	Woodrush	**INDICATOR**
Melica harfordii	Harford's melica	ONP Extremely Rare
Melica subulata var. *subulata*	Alaska oniongrass	
Stipa lemmonii var. *lemmonii*	Lemon's needlegrass	ONP Extremely Rare
Torreyochloa pauciflora var. *pauciflora*	Few-flowered torreyochloa	
Trisetum cernuum	Nodding trisetum	

Species	**Common Name**	**Notes**
Vulpia microstachys var. *ciliata*	Nuttall's fescue	
Vulpia microstachys var. *microstachys*	Nuttall's fescue	
Herbs		
Achillea millefolium var. *lanulosa*	Common yarrow	
Agoseris spp.	Agoseris	
Anaphalis margaritacea	Pearly-everlasting	
Anemone lyallii	Anemone	
Arabis spp.	Rockcress	
Asarum caudatum	Wild ginger	
Athysanus pusillus var. *pusillus*	Sandweed	ONP Extremely Rare
Brodiaea coronaria var. *coronaria*	Harvest coronaria	
Calypso bulbosa	Fairy slipper	
Campanula scouleri	Scouler's bellflower	**INDICATOR**
Cardamine integrifolia var. *sinuata*	Milk maids	
Cardamine nuttallii var. *pulcherrima*	Slender bittercress	**INDICATOR**
Cardamine oligosperma	Little western bittercress	**INDICATOR**
Cimicifuga elata	Tall bugbane	WNHP-listed Sensitive
Circaea alpina ssp. *pacifica*	Enchanter's nightshade	
Circium edule	Indian thistle	
Clarkia amoena ssp. *caurina*	Farewell-to-spring	
Claytonia exigua var. *glauca* (?)	Pale springbeauty	ONP Rare
Claytonia perfoliata var. ?	Miner's lettuce	
Claytonia sibirica var. *sibirica*	Siberian springbeauty	**INDICATOR**
Collinsia parviflora var. *grandiflora*	Small-flowered blue-eyed Mary	
Collomia heterophylla	Varied-leaf collomia	
Crocidium multicaule	Spring-gold	ONP Extremely Rare
Cryptantha intermedia var. *grandiflora*	Cryptantha	
Daucus pusillus var. *pusillus*	Rattlesnake weed	
Dichelostemma pulchellum var. *pulchellum*	Ookow dichelostemma	

Species	Common Name	Notes
Dodecatheon dentatum ssp. *dentatum*	White shooting star	ONP Extremely Rare
Epilobium ciliatum ssp. *glandulosum*	Common willow-herb	
Epipactis gigantea	Giant helleborine	WNHP-listed Sensitive
Fragaria vesca ssp. *bracteata*	Wood strawberry	**INDICATOR**
Fritillaria lanceolata	Mission-bells	
Galium aparine	Cleavers bedstraw	
Galium triflorum	Fragrant bedstraw	
Geranium bicknellii var. *bicknellii*	Bicknell's geranium	ONP Extremely Rare
Geum macrophyllum	Largeleaved avens	
Goodyera oblongiflorum	Western rattlesnake-plantain	
Heuchera micrantha var. *diversifolia*	Small-flowered alumroot	
Hieracium albiflorum	White-flowered hawkweed	**INDICATOR**
Lithophragma parviflorum	Small-flowered prairiestar	
Lobelia dortmanna	Water lobelia	WNHP-listed Sensitive
Lomatium utriculatum	Pomo-celery	
Lotus denticulatus	Meadow lotus	ONP Extremely Rare
Madia exigua	Little tarweed	
Madia madioides	Woodland tarweed	
Microsteris gracilis ssp. *gracilis*	Pink microsteris	
Microsteris gracilis ssp. *humilis*	Pink microsteris	
Mimulus alsinoides	Chickweed monkeyflower	
Mimulus guttatus ssp. *guttatus*	Common western monkeyflower	
Mimulus lewisii	Great purple monkeyflower	
Mimulus nasutus var. *nasutus*	Large-nosed monkeyflower	ONP Extremely Rare
Mitella ovalis	Oval-leaved mitrewort	**INDICATOR**
Moehringia macrophylla	Big-leaved sandwort	
Montia diffusa	Branching montia	WNHP-listed Sensitive
Montia parviflora var. *flagellaris*	Little-leaf montia	
Montia parviflora var. *parviflora*	Little-leaf montia	
Nemophila parviflora var. *parviflora*	Small-flowered nemophila	**INDICATOR**
Oenanthe sarmentosa	Pacific oenanthe	
Osmorhiza chilensis	Mountain sweet-cicely	
Petasites frigidus var. *palmatus*	Palmate butterbur	

Species	**Common Name**	**Notes**
Plectritis congesta ssp. *brachystemon*	Rosy plectritis	
Pyrola asarifolia ssp. *bracteata*	Common pink pyrola	
Pyrola picta	Whitevein pyrola	
Ranunculus uncinatus var. *parviflorus*	Western woods-buttercup	**INDICATOR**
Rumex salicifolius	Willow-leaved dock	
Sanicula crassicaulis var. *tripartita*	Pacific sanicle	
Satureja douglasii	Yerba buena	**INDICATOR**
Saxifraga integrifolia var. *integrifolia*	Early saxifrage	
Sedum oreganum ssp. *tenue*	Oregon sedum	
Sedum spathulifolium ssp. *spathulifolium*	Broad-leaved sedum	
Silene antirrhina	Sleepy catchfly	
Sisyrinchium douglasii var. *douglasii*	Grass-widows	
Stachys cooleyae	Cooley's hedge-nettle	
Stellaria nitens	Shining chickweed	ONP Rare
Streptopus amplexifolius var. *americanus*	Clasping-leaved twisted-stalk	
Tiarella trifoliata var. *trifoliata*	Trefoil snowflower	
Tolmiea menziesii	Youth-on-age	
Tonella tenella	Small-flowered tonella	ONP Extremely Rare
Trifolium microcephalum	Small-headed clover	
Trifolium microdon	Thimble clover	
Trifolium oliganthum	Few-flowered clover	
Trifolium tridentatum	Tomcat clover	
Triteleia hyacinthina	Hyacinth triteleia	
Urtica dioica ssp. *gracilis* var. *lyallii*	Stinging nettle	
Valeriana scouleri	Scouler's valerian	
Vicia americana ssp. *americana*	American vetch	
Vicia villosa	Wooly vetch	
Viola adunca var. *adunca*	Hook violet	
Viola howellii	Howell's violet	
Viola sempervirens	Evergreen violet	
Yabea microcarpa	California hedge-parsley	ONP Extremely Rare

Species	**Common Name**	**Notes**
Shrubs		
Arctostaphylos columbiana	Bristly manzanita	
Ceanothus sanguineus	Ceanothus	
Chimaphila umbellata ssp. *occidentalis*	Common pipsissewa	
Cornus unalaschkensis	Unalaska bunchberry	
Gaultheria shallon	Salal	**INDICATOR**
Holodiscus discolor var. *discolor*	Ocean-spray	**INDICATOR**
Linnaea borealis ssp. *longiflora*	Twinflower	
Mahonia aquifolium	Shining Oregongrape	
Mahonia nervosa	Dull Oregongrape	**INDICATOR**
Oemleria cerasiformis	Indian plum	
Pachistima myrsinites	Oregon box	
Philadelphus lewisii var. *gordonianus*	Lewis' mockorange	
Ribes divaricatum var. *divaricatum*	Coast black gooseberry	
Ribes lacustre	Swamp gooseberry	
Ribes lobbii	Gummy gooseberry	
Ribes sanguineum var. *sanguineum*	Red-flowering currant	
Rosa gymnocarpa var. *gymnocarpa*	Baldhip rose	**INDICATOR**
Rosa nutka var. *hispida*	Nootka rose	
Rubus parviflorus var. *parviflorus*	Western thimbleberry	
Rubus spectabilis var. *spectabilis*	Salmonberry	
Rubus ursinus ssp. *macropetalus*	Pacific blackberry	**INDICATOR**
Symphoricarpos albus var. *laevigatus*	Common snowberry	**INDICATOR**
Vaccinium parvifolium	Red huckleberry	**INDICATOR**
Whipplea modesta	Yerba de selva	
Trees		
Abies grandis	Grand fir	**INDICATOR**
Acer circinatum	Vine maple	
Acer glabrum var. *douglasii*	Douglas maple	
Acer macrophyllum	Big-leaf maple	**INDICATOR**
Alnus rubra	Red alder	**INDICATOR**

Species	**Common Name**	**Notes**
Alnus viridis ssp. *sinuata*	Sitka alder	
Arbutus menziesii	Pacific madrona	**INDICATOR**
Cornus nuttallii	Pacific dogwood	
Pinus monticola	Western white pine	
Populus balsamifera ssp. *trichocarpa*	Black cottonwood	**INDICATOR**
Prunus emarginata var. *mollis*	Bitter cherry	
Pseudotsuga menziesii var. *menziesii*	Douglas-fir	**INDICATOR**
Rhamnus purshiana	Cascara	
Salix hookeriana	Hooker willow	
Salix lasiandra	Pacific willow	
Salix scouleriana	Scouler willow	
Salix sitchensis	Sitka willow	
Taxus brevifolia	Pacific yew	
Thuja plicata	Western redcedar	**INDICATOR**
Tsuga heterophylla	Western hemlock	**INDICATOR**

ONP - Olympic National Park
WNHP - Washington Natural Heritage Program
INDICATOR - Taxa used for classifying vegetation types within project area(s).

Table H-2. Exotic/adventive plants found in Elwha Valley, Olympic National Park (from Olson et al. 1991).

Species	Common Name	Term[1]	Risk[2]
Trees			
Ilex aquifolium	English holly	Per	Ser
Malus sylvestris	Cultivated apple	Per	Low
Shrubs			
Cytisus scoparius	Scot's broom	Per	Sig
Herbs			
Arctium minus	Common burdock	Bi	NR
Bellis perennis	English daisy	Per	Low
Calystegia sepium ssp. *sepium*	Wild morning-glory	Per	NR
Capsella bursa-pastoris var. *bursa-pastoris*	Shepherd's-purse	Ann	Low
Centaurea cyanus	Cornflower	Ann	Low
Cerastium fontanum ssp. *triviale*	Common chickweed	Per	Sig
Cereastium glomeratum	Sticky chickweed	Ann	Pot
Cirsium arvense var. *horridum*	Canada thistle	Per	Ser
Cirsium vulgare	Bull thistle	Bi	Pot
Convolvulus arvensis	Field bindweed	Per	NR
Crepis capillaris	Smooth hawksbeard	Bi	Low
Daucus carota	Queen Anne's lace	Bi	Low
Digitalis purpurea	Foxglove	Bi	Pot
Erophila verna ssp. *praecox*	Spring whitlow-grass	Ann	NR
Erophila verna ssp. *verna*	Spring whitlow-grass	Ann	NR
Eschscholtzia californica ssp. *californica*	California poppy	Per	NR
Galium odoratum	Sweet woodruff	Per	Pot
Geranium dissectum	Cutleaf geranium	Ann	Low
Glecoma hederacea	Ground ivy	Per	NR
Hypericum calycinum	Jerusalem star	Per	Pot
Hypericum perforatum	Common St. John's-wort	Per	Sig
Hypochaeris radicata	Hairy cat's-ear	Per	NR
Lathyrus latifolius	Everlasting peavine	Per	NR
Lathyrus sylvestris	Sm everlasting peavine	Per	Sig
Leucanthemum vulgare	Ox-eye-daisy	Per	Sig

Table H-2.   Continued.

Species	Common Name	Term[1]	Risk[2]
Linaria vulgaris	Butter and eggs	Per	NR
Mycelis muralis	Wall lettuce	Bi	NR
Myosotis spp.	Forget-me-not	Bi	Low
Narcissus psuedonarcissus	Daffodil	Per	Low
Papaver oreintale	Oriental poppy	Per	NR
Plantago spp.	Plantain	Per	NR
Polygonum aviculare	Common knotweed	Ann	NR
Polygonum sachalinense	Giant knotweed	Per	Sig
Prunella vulgaris	Self-heal	Per	Pot
Ranunculus spp.	Buttercup	Per	NR
Rubus discolor	Himalayan blackberry	Per	NR
Rumex acetosella	Sheep sorrel	Per	NR
Rumex crispus	Curly dock	Per	Pot
Saponaria officinalis	Bouncing bet	Per	NR
Senecio jacobaea	Tansy ragwort	Per	Sig
Sonchus asper	Prickly sow-thistle	Ann	NR
Stellaria media	Chickweed	Ann	Pot
Taraxacum officinale	Common dandelion	Per	Ser
Tragopogon dubius	Yellow salsify	Bi	Low
Trifolium spp.	Clover	Ann-Per	NR
Verbascum thapsus	Common mullein	Bi	NR
Vicia sativa	Common vetch	Per	NR
Grasses			
Agropyron repens	Quackgrass	Per	Sig
Agrostis spp.	Redtop	Per	Pot
Aira caraophyllea	Silver hairgrass	Per	Low
Aira praecox	Early hairgrass	Ann	Low
Bromus hordeaceus	Soft brome	Ann	NR
Bromus tectorum	Cheatgrass	Ann	Pot
Cynosurus cristatus	Crested dogtail	Per	Pot
Dactylis glomerata	Orchardgrass	Per	Sig
Holcus lanatus	Common velvet-grass	Per	NR
Lolium nultiflorum	Italian ryegrass	Bi-Per	NR
Lolium perenne	Perennial ryegrass	Per	NR
Phalaris arundinacea	Reed canarygrass	Per	Ser
Phleum pratense	Common timothy	Per	NR
Poa spp.	Bluegrass	Per	Ser

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[1] Per = perennial; Bi = biennial; Ann = annual.

[2] Classification based on numeric Exotic Plant Rating System developed by Olympic National Park which evaluates each exotic species against 17 biological criteria including autecology, reproduction, and aggressiveness. Pot = potential; sig=significant; Ser = serious; NR = not rated.

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APPENDIX I

DISPOSITION OF PROJECT LANDS

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APPENDIX I

DISPOSITION OF PROJECT LANDS

TRANSFER IN TRUST TO LOWER ELWHA S'KLALLAM TRIBE

I. INTRODUCTION

The Elwha River Fisheries and Ecosystem Restoration Act (P.L. 102-495) directs the Secretary of the Interior to consider the transfer of lands associated with the Elwha and Glines Canyon projects "to the Lower Elwha Klallam Tribe in trust for tribal housing, cultural or economic development purposes". The Tribe is interested in gaining beneficial title to lands within the project boundaries that will sustain limited development for badly needed housing and other economic ventures, within environmental constraints. Land uses proposed by the Tribe are designed to meet long-term objectives for residential and economic development to the benefit of the Tribe and surrounding community, and to avoid adversely affecting restoration activities. Implementation strategies will focus on methods to determine and manage an appropriate quantity and density of development while protecting the river ecosystem and maintaining the scenic attraction of the area. The management philosophy of the Tribe espouses environmental stewardship, interagency coordination, and an active role in natural resources and ecosystem restoration. Responsible stewardship has always been a significant element in a culture whose members have depended physically and spiritually on natural resources.

Restoration of the river ecosystem, particularly the anadromous fisheries, is of paramount importance, both culturally and economically. The Tribe fully supports management of the central river corridor to protect the fish and wildlife resources of the Elwha River. Creation of a conservation or refuge area would preserve the area and help fulfill river restoration objectives. At this time, the Tribe does not have sufficient financial or technical resources to assume full responsibility for restoration and management of conservation lands. However, the Tribe is willing to explore the possibility of a cooperative venture to restore and manage the river corridor, and could eventually assume management responsibility for project lands. These lands also contain traditional and cultural properties of great significance to the Tribe. The Tribe is interested in management of these lands for cultural purposes, including hunting, fishing, spiritual practices and sustainable gathering of resources. As participants in restoration and management of the river corridor, the Tribe will continue its active role in the historic and unprecedented restoration of the Elwha river ecosystem.

The Elwha S'Klallam Tribe has been integrally involved in proceedings regarding the licensing of the Elwha and Glines

Canyon dams, the dialogue and debate among local and regional interests regarding the future of the Elwha River, and the negotiated provisions included in P.L. 102-495. Dam removal and acquisition of project lands by the United States in trust for the Tribe would dramatically improve the Tribe's ability to develop a strong economic and cultural presence, and to provide community, stability and opportunities for education and employment to all members. It represents an opportunity to enlarge the tribal land base, meet the needs of tribal members and ensure stewardship and restoration of the Elwha River, upon which the Tribe is traditionally and culturally dependent.

II. LAND USE

General land use designations have been proposed on the basis of environmental constraints, natural resources, environmental and cultural resources, environmental carrying capacity, and population and housing needs projections. Land use activities on project lands have been classified into residential, economic development, natural resources management, refuge, and mixed use districts. Development of each of these districts will be guided by specific goals, objectives, and implementation standards. A brief description of each classification follows.

A. CONSERVATION/REFUGE

About 600 acres of the project lands are located within the river corridor. This land would be set aside in perpetuity to preserve and protect scenic resources and ecosystem. At this time, the Tribe does not have sufficient financial or technical resources to assume full responsibility for restoration and management of conservation lands. However, the Tribe is willing to explore the possibility of a cooperative venture to restore and manage the river corridor, and could eventually assume management responsibility for the project lands. As participants in restoration and management of the river corridor, the Tribe will continue its active role in the historic and unprecedented restoration of the Elwha river ecosystem.

Restoration and management of refuge lands will be conducted according to a Restoration and Management Plan, that will be developed and implemented with the cooperation of those agencies with relevant expertise and resources. These lands also contain traditional and cultural properties of great significance to the Elwha Tribe. The Tribe is interested in management of these lands for cultural purposes, including hunting, fishing, spiritual practices and sustainable gathering of resources. Use of refuge lands will be limited to hiking, fishing, hunting and gathering of traditional cultural resources, including but not limited to cedar trees, wild plants, and secondary forest products. Vegetation management will eventually return the river corridor to the desired mixed coniferous-deciduous forest representative of large river systems in the region. A pedestrian trail system could be established to promote visitation in the refuge along with understanding and enjoyment of the restoration process.

B. RESIDENTIAL

Based on soil and topography, approximately 120 acres appear suitable for residential development, although access problems could reduce that figure to about 70 acres suitable for residential or mixed use development. Residential areas would provide badly needed housing for Tribal members. Clustered development and multiple-unit housing will be integrated with single family homes. Residential areas will attempt to provide community neighborhoods and safe, affordable housing.

C. ECONOMIC DEVELOPMENT

Less than 100 acres of project lands are located adjacent to Highway 101 and appear suitable for economic development. An additional 70 acres are identified under mixed use and will also be suitable for some economic development. These areas will sustain activities that support tribal and federal self-determination and economic self-sufficiency policies. Development within these areas must be appropriate to the setting and supported by the tribal economic development plan and strategic economic policy. Economic development scenarios are currently being developed and cover a range of uses. While some emphasis is placed upon high income-generating development ventures, the opportunity also exists to pursue development activities oriented towards recreational opportunities in and around the river system, and that highlight the educational and research opportunities provided by the restoration project.

D. NATURAL RESOURCE

Roughly 100 acres would not support development but could be managed for groundwater protection, timber production, recreation, fish and wildlife conservation, traditional cultural uses, and the preservation of essential watershed functions and values. The primary use of this land will be to conserve natural resources, with an emphasis on providing scenic and cultural resources. The use of alternative and progressive forest practices will be encouraged on these lands. The open natural character of the landscape will be preserved and natural biophysical processes of the area protected. Use of this land type will be governed by a natural resources management plan.

E. MIXED USE

Approximately 70 acres are located close to access roads and could sustain either housing, or small-scale economic ventures, or both. These areas will allow for a combination of small-scale economic development (including cottage industries) with residential uses.

III. PRELIMINARY GOALS AND OBJECTIVES

A tribal planning group is developing goals and policies to further define tribal priorities and land use. These goals will help to define tribal environmental policy and create a policy framework for the development of the Lake Aldwell lands. Following are the initial suggestions being considered.

A. PROTECTION AND RESTORATION OF ECOSYSTEM

The Tribe's primary concern for the Lake Aldwell area is to protect and manage the river corridor ecosystem and associated fish populations. The Elwha Tribe recognizes the necessity of a conservation or refuge area to preserve, protect, restore and maintain the Elwha River corridor, fisheries and ecosystem. The refuge should incorporate all lands within the river corridor and associated uplands necessary to maintain the river ecosystem. Management of refuge lands should incorporate some level of coordination and assistance between agencies with expertise in river restoration and refuge management.

Designated areas and sensitive zones within the river corridor should be protected from surface or habitat disturbance activities. Natural conditions should be preserved and rehabilitated, including native species of plants and animals. Sites of cultural and historic value within the refuge will be designated and protected. Treaty rights must be recognized within the refuge. Restoration and management responsibilities must be shared by the agencies with appropriate expertise and ability.

B. ENVIRONMENT

The Tribe recognizes the inherent value in clean air, clean water, a restored fisheries, and environmentally safe and sustainable living conditions. Every effort will be made to protect these and related values. Development plans will acknowledge and accommodate environmental constraints and include environmental protection policies and enforcement mechanisms that will assist in the preservation, conservation and enhancement of natural resources. Upslope activities will be designed to minimize impacts to the watershed, integrating natural processes with sensible land management planning. Environmentally sensitive areas on project lands will be identified through the development of specific criteria for the classification of sensitive lands, as well as policy and ordinances necessary to protect these resources.

The Tribe strongly advocates cooperative watershed planning and management as an avenue for fish and wildlife habitat restoration and protection, protection of water rights and water quality, and protection of cultural places of religious, traditional and historical significance to the Lower Elwha S'Klallam Tribe. Watershed stability, restoration and sustainability will be achieved through cooperative watershed management plans and sustainable management of natural resources.

C. HOUSING

A high priority of the Tribe is to provide appropriate housing to meet Tribal housing needs. Every member family should be assured decent, safe housing according to its individual needs. The availability of high quality, low income public and private housing for occupancy by tribal members should be promoted, as should the long range usefulness of the housing stock developed on the reservation.

An emphasis will be placed upon the development of multiple unit, clustered housing to provide the lowest possible housing cost for groups and individuals unable to afford or manage care of a single family house. This will also allow for large community recreation facilities and areas of shared open space. Each housing development should strive to create a feeling of close community and connection between Tribal members.

Housing planning will be coordinated with standards for protection of water resources, fish and wildlife habitat, protection of cultural places, and protection of productive natural resource economic units. Codes and standards that promote quality residential development and protect the environment will be established.

D. ECONOMIC DEVELOPMENT

Opportunities for economic development that emphasize and promote traditional values of respect towards, and an understanding of, natural systems will be encouraged. Land use decisions should strive to combine the stewardship of natural resources with the development of economic opportunities for the Tribe and tribal members.

Economic development should emphasize activities that result in positive long-term cost/benefit ratios. Some of the economic development ventures undertaken on project lands will recognize the importance of the Elwha River ecosystem to the Elwha Tribe, foster understanding of the ecosystem, and encourage the active restoration of the river corridor.

E. FISHERIES

The fisheries resources of the Elwha River are of vital historical, economic and cultural importance to the Lower Elwha Tribe. These resources should be restored, preserved, protected and enhanced as a principle priority of the Tribe. Management practices affecting fisheries will accommodate the goals of the Puget Sound Salmon Management Plan and the Salmon and Steelhead Management Plan for Strait of Juan de Fuca Terminal Areas.

A priority of management of the Elwha Project lands should be to protect and rehabilitate fish habitat, to recover historic fishing sites, and return former habitat to fish use. The fisheries potential of all area streams should be maximized while preserving their other numerous natural resource benefits.

F. CULTURAL RESOURCES

Every effort will be made to preserve the history and traditional culture of the Lower Elwha S'Klallam Tribe. Sites that have historical significance and traditional cultural properties will be protected, maintained and enhanced. Use of cultural resources on tribal land will be promoted and protected.

Valuable cultural and historical lands will be acquired by the Tribe when available. When these areas are on non-tribal, federal land, every effort will be made to develop a cooperative agreement with the governing agency, to recognize and protect those areas, and to preserve the right of the Tribe to use the area for cultural purposes. Establishment of a tribal burial ground in an ecologically and culturally appropriate location out of the floodplain is a priority for the Elwha Tribe.

G. NATURAL RESOURCES

Suitable forested lands will be managed for natural resources, including secondary forest products, alternative forestry practices, and cultural resources. Selected project lands will be used for traditional and cultural purposes, including fishing, hunting, gathering of renewable resources, and spiritual practices.

An economically viable and sustainable forestry management program that does not adversely impact other natural resources of the Elwha Tribe will be developed. Progressive forestry and ground cover management programs will emphasize alternative forestry techniques and a sustainable yearly income over long-term rotations. The multiple use concept of forest management will be encouraged and utilized in appropriate areas.

Forest management plan alternatives and policies will include specifics on streamside management, fish and wildlife and cultural resource protection, and be compatible with state and federal regulations. Low impact forest practices such as selective cutting of timber, longer rotations and soil conservation techniques will be used to minimize impacts to the watershed. Effective buffer strips will be designed to protect and enhance riparian area habitat along tributary streams not protected under refuge status.

IV. IMPLEMENTATION

Development of project lands provided in trust to the Tribe must occur in such a manner that both the quality and quantity of future development comply with Tribal policies and environmental limitations. The policies contained in this plan are intended to promote the long-term quality of the project land's physical, social, and economic environment. An implementation framework for development of project lands will consist of regulations and management programs formulated to achieve the Tribe's land use objectives and policies. Implementation regulations will be developed as the initial framework to direct development of the project lands following decisions on land allocation. Implementation tools may include a zoning ordinance, a subdivision ordinance, a river corridor management ordinance, a building code, and other regulatory programs deemed necessary to carry out the intent of the plan.

A watershed-based approach to planning and some level of cooperative management is necessary for effective restoration and sound management of the Elwha River ecosystem and fisheries. Cooperative planning efforts for the Port Angeles watershed (which includes the Elwha River) are in the formative stages. It is the intention of the Lower Elwha S'Klallam Tribe to participate in County and City planning efforts, to encourage cooperative planning wherever possible, to facilitate consistent management plans across jurisdictional boundaries, and to ensure protection of the area's natural and human resources. Management programs will address the different land use elements and will further clarify future directions and goals. These may include a housing program, a utilities program, a capital facilities program, a natural resources program (including a refuge management plan and cooperative agreements regarding responsibility for restoring and managing project lands), and a transportation program. Implementation programs shall provide innovative techniques for attaining goals and policies within each of the functional areas.

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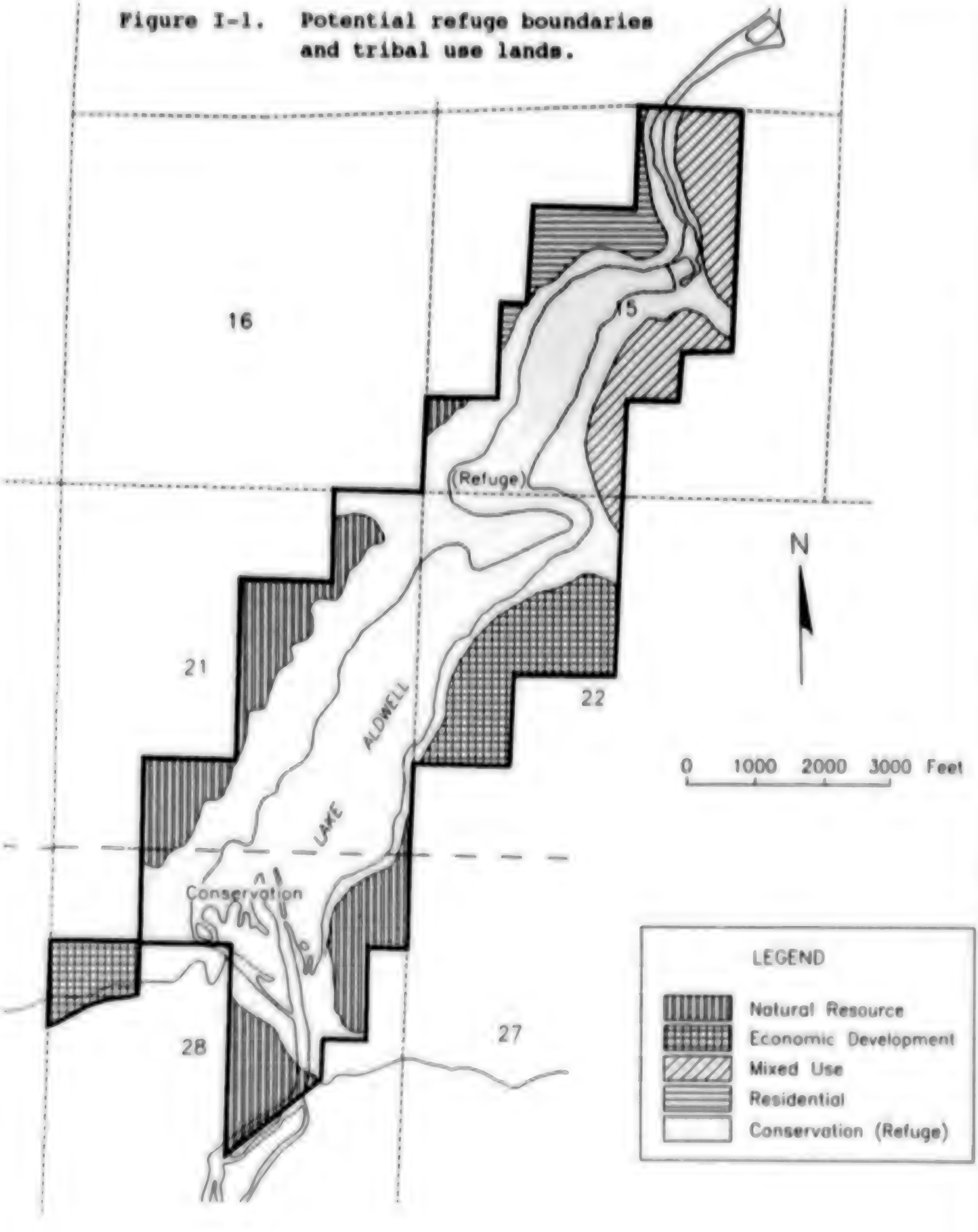
Figure I-1. Potential refuge boundaries and tribal use lands.



PROPOSED FUTURE MANAGEMENT OF GLINES CANYON PROJECT SITE AND BACKCOUNTRY/WILDERNESS CONCERNS DURING DAM REMOVAL

I. INTRODUCTION

The purpose of the following discussion is to outline backcountry/wilderness concerns related to the Glines Canyon Project area and to develop a draft proposal for management of the restored area within Olympic National Park. Present backcountry facilities are summarized, the steps needed to develop a post restoration management strategy are outlined, and desired future conditions are recommended. Also included are general guidelines for project work proposed in designated Wilderness and in pristine/primitive areas not officially designated as Wilderness.

II. PRESENT CONDITIONS

- Designated Wilderness adjoins the project site. Descriptions of the Wilderness boundary may be found on "Wilderness Boundary" maps, August 1988, Joyce and Mount Olympus quadrangles.

- West Lake Mills Trail (2.0 miles between boat launch and Boulder Creek). Numerous campsites are scattered throughout the area.

- Lake Mills Trail (ca. 0.3 miles between Whiskey Bend road and head of reservoir). Several campsites are in the area.

- There are some dispersed campsites at the head of Lake Mills, particularly near the mouth of Cat Creek. Most are related to use by anglers and would be rendered obsolete by the disappearance of the reservoir.

III. FUTURE CONDITIONS - CONSIDERATIONS AND PLANNING REQUIREMENTS

There are two major areas of consideration in reference to wilderness/backcountry concerns: (1) guidelines on project work proposed within pristine/primitive or Wilderness areas; and (2) direction on post-project management of the area. A fundamental component in building a future management strategy for the project area is assignment of land use classification(s). The area, or portions of the area, could be managed for frontcountry recreational opportunities with developed campgrounds and roads, primarily for backcountry recreational opportunities, or for wilderness opportunities. The need for roads or other access and motorized equipment for ongoing maintenance of the restoration site would affect the land use classification.

Development of a future (post-restoration) management strategy for the project area includes the following steps:

- Allocate the Glines Canyon Project area into use classification zones and define the boundaries of each.

- Determine if those areas within the natural zone should be managed as backcountry or wilderness. Is the area to be recreation oriented or wilderness value oriented? Should the area be managed as backcountry, but not wilderness, with options left open for future development of recreational facilities or as wilderness moving toward Congressional designation?

- Allocate Opportunity Classes according to the future natural, social and managerial conditions desired in specific locations throughout the natural zone.

- Monitor conditions within the natural zone to determine if Wilderness Plan standards are met.

- Restore wilderness conditions, including both ecosystem processes and use related conditions to as pristine a level as practicable within Opportunity Class standards. Improve or restore designated campsites and trails and remove or restore natural conditions in targeted main trails, social trails, campsites, and day use sites.

IV. RECOMMENDATIONS FOR DESIRED FUTURE CONDITIONS

Restoration of the ecosystem in the Glines Canyon Project area provides the opportunity to restore wilderness conditions. An area where presently "man and his own works dominate the landscape" can be restored to "an area where the earth and its community of life are untrammeled by man" (Wilderness Act 1964). Wilderness restoration and ecological restoration are in large part much the same thing, and thus a goal for the project area should be restoration of ecological processes and restoration of wilderness. Following is a listing of recommendations to achieve this goal.

In all alternatives, the majority of the Glines Canyon Project area would be classified as a "natural zone" managed under backcountry/wilderness guidelines. In Alternative A, the "developed zone" would end at the Elwha Ranger Station with all land above designated "natural zone". The Elwha Campground would be expanded and Altaire Campground either removed or rehabilitated into a backcountry camp area. The Hot Springs Road would be removed beginning at the junction of the Whiskey Bend Road and rehabilitated into a trail corridor. A trailhead parking lot would be constructed in the vicinity of the Ranger Station.

In Alternative B, the "developed zone" would end at Altaire Campground with all land above designated "natural zone". The Hot Springs Road would be removed above Altaire and maintained as a trail corridor. A trailhead parking lot would be constructed in the vicinity of Altaire. After analysis of the floodplain, a decision would be made to either retain or remove the Altaire Campground.

In Alternative C, the "developed zone" would end in the vicinity of the dam operator's house with all land above designated "natural zone". The trailhead parking lot would be constructed in the vicinity of the operator's house. The closed road above the new trailhead would be removed and rehabilitated into a trail corridor.

The removal/restoration project should be designed and performed in such a way that upon project completion, ongoing maintenance needs requiring roads and major mechanized equipment would not be necessary. As a final part of dam removal and restoration, all development associated with project work should be restored to natural conditions.

Areas in the vicinity of the project site that have Wilderness designation should suffer no impacts as a result of removal/restoration work unless the product is absolutely necessary to meet the project's objectives and no other alternatives are practicable, or the resultant impacts from another alternative would have more serious consequences than the resultant impacts to the Wilderness. Project impacts to areas not designated as Wilderness within the project site but that still retain pristine or primitive conditions should likewise only be permitted if the product is necessary to meet the project's objectives and no other alternatives are practicable, or alternatives would result in more serious adverse impacts.

In all alternatives, those areas proposed as "natural zone" should be designated by Congress as Proposed Wilderness during major restoration, with Wilderness being officially designated when major restoration work requiring developments, facilities, major mechanized equipment, is complete. Opportunity Classes should be allocated, conditions monitored, and specific plans outlined for restoration of wilderness conditions in conjunction with dam removal/project site restoration (ecosystem restoration actions and wilderness restoration actions would in many cases be the same). In all alternatives, the majority of the project area would fall within Opportunity Class IV - Pristine. Wilderness conditions within this Class, including both ecosystem processes and use related impacts, would be restored to as pristine a level as practicable during restoration work with the long-term goal being restoration of conditions to pristine standards.

In Alternatives A through C, allocation of Class III - Primitive would be limited to a trail corridor between Boulder Creek and Cat Creek and the area at the mouth of Cat Creek. Camping would only be permitted on the gravel bars, providing visitors with a primitive wilderness experience.

In all alternatives, the West Lake Mills Trail between the present boat launch and Boulder Creek would be retained and maintained as a foot trail. Two to four campsites at the trail's end would be restored to wilderness standards, the remaining non-designated sites and social trail impacts eliminated during project work. The present Lake Mills Trail between the Whiskey Bend road and the present head of the reservoir would remain a foot trail to the waterfall, with an extension built to the river if determined appropriate. One to two campsites would be restored to wilderness standards, and the remaining sites and social trail impacts eliminated during project work. Both of these trail corridors and camp areas would be allocated as Opportunity Class II.

Those sections of the Olympic Hot Springs Road targeted for removal and rehabilitation as trail corridors in the three alternatives would become Opportunity Class I (or Day Use Opportunity Class depending on which areas are targeted for no overnight camping). Thus in Alternative A, Opportunity Class I would be allocated along the trail corridor from the new trailhead near the Elwha Ranger Station, to Olympic Hot Springs. In Alternative B, Opportunity Class I would be allocated along the trail corridor from the new trailhead near the present Altaire Campground to Olympic Hot Springs. In Alternative C, Opportunity Class I would be allocated along the trail corridor from the new trailhead near the present site of the dam operator's house to Olympic Hot Springs.

Ongoing monitoring of wilderness conditions would be necessary under all alternatives following project completion. Monitoring would determine if Wilderness Plan standards are being met and determine the management action(s) necessary to bring conditions back within standard.

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APPENDIX J

INTERPRETING DAM REMOVAL

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APPENDIX J

INTERPRETING DAM REMOVAL

I. Introduction

Interpretation of the removal of the Elwha and Glines Canyon dams would be complex, covering several messages from several agencies (e.g., National Park Service, Fish and Wildlife Service) and governments (e.g., Lower Elwha S'Klallam Tribe, Clallam County) at many diverse sites. To provide these efforts, several new facilities are recommended.

II. FACILITY NEEDS

The ideal approach would be to have an interagency educational informational center located on Highway 101 with covered exhibit shelters at each dam site and a hiking/bicycle trail between the mouth of the river and the two dam locations. Under this scenario the Interpretive Center on Highway 101 would provide the overall story while the site exhibits would focus on what can be seen from the sites. All facility sites should be wheelchair accessible and include restrooms.

A. EXHIBIT SHELTERS AT DAM SITES

Interpretation at the Glines Canyon site would interpret the physical characteristics of its removal, emphasizing the geological and biological story. Interpretation at the Elwha Dam site would interpret the physical characteristics of its removal, emphasizing cultural aspects. Both sites would cross reference to a lesser degree the story told at the other site without being repetitive. However the nature of the interpretation would probably be different in scope between the two sites. Since both the Glines Canyon and Elwha sites would be attractions, provisions would have to be made to deal with high visitor use.

Because of its location within Olympic National Park, the Glines Canyon site is a good candidate for a combination of staffed and static interpretive efforts. This site is likely to be the greater attraction so would necessitate a series of interpretive talks scheduled throughout the day. A facility at this site should provide an overlook facing upstream with a view of the previous impoundment area. This would allow visitors to view what originally lay there, what the impoundment looked like, and finally what restoration efforts have accomplished. Site specific messages should concentrate on restoration efforts, the value of clear downstream channels for stream composition (i.e., gravel recruitment and water quality) and access of anadromous fish to headwater spawning areas.

The Glines Canyon powerhouse is in a suitable location for interpretation. However, significant problems would have to be overcome, as with the Elwha powerhouse (see below). Between the dam site and the powerhouse, near the base of the surge tower, might be a more suitable site, with a walking trail access from the upper site and a relatively small handicapped parking lot near the overlook site. This site would allow a dramatic view both upstream and downstream. Messages should center around the reasons for dam removal and the need for governmental protection of natural resources.

The Elwha Dam site is a good candidate for a static, unstaffed interpretive site based around interpretive signs and a covered viewpoint and interpretive facility, perhaps similar in design to the Olympic National Park interpretive site at the base of the Sol Duc Valley. A shelter of this type is weather resistant, built of local materials, and is aesthetically pleasing and relatively unobtrusive. Interpretive efforts at the Elwha site should center on the biological effects on the anadromous fish resource and the effects its loss has had on local native peoples. Because of the view of the river and of restoration efforts upstream, this is a good site to discuss the before and after.

Costs for each exhibit shelter:		
	Planning	$50,000
	Structure	50,000
	Exhibits	50,000
	Site prep and parking	100,000
	Rest rooms	50,000
	unit costs	300,000
	Total cost for shelters at both sites	600,000

Although use of the Elwha powerhouse for interpretation has been suggested, it has significant drawbacks including (1) the building may not be suitable for an interpretive center due to condition, cost of maintenance, original design, location, adaptability to meet handicapped access, safety, and sanitary requirements, and (2) parking and handicapped accessibility would be extremely limited at the site without extensive site preparation and modification.

B. INTERAGENCY EDUCATIONAL INTERPRETIVE CENTER

Because both dam sites are some distance from the highway, some type of highway-based interpretive center should be developed directly along the Highway 101 corridor. This site should include restroom facilities, parking, possibly a picnic area, and informational and interpretive signs designed to prompt interest in the other sites. Without such a facility, many visitors would miss the opportunity to get an overview of the project, understand the reasons for its implementation, and be guided to the dam sites. Should a fish refuge be established on the Elwha River, a combination administrative headquarters/interpretive facility could be established near the Highway 101 bridge. The function of the facility would be to prompt tourists to stop at a "roadside attraction" which would both provide an interpretation of the refuge's restoration objectives and goals as well as direct them to other sites. Failure to build an attractive, effective roadside site would result in limited public understanding of the overall Elwha project and suboptimal visitation to the other sites.

Primary active participation would be by Olympic National Park, the Lower Elwha S'Klallam Tribe and the U.S. Fish and Wildlife Service. Input and cooperation with other Federal, Washington State, and Clallam County agencies concerned with resource issues, transportation, planning and tourism would be important.

Such an interagency visitor center is consistent with objectives expressed at the recent Washington Coastal Corridor Conference held in Ocean Shores in October 1992. It is also consistent with concepts developed during a two day Highway 101 loop interpretive preplanning trip by a task group of the Olympic Peninsula Information Network (OPIN). OPIN is an informal interagency (Federal, State, local and private) group with representatives from agencies with responsibilities for land, resources management, and tourism on the Olympic Peninsula. An objective of OPIN is to share information between agencies and to provide it to visitors and local residents in an objective manner. OPIN may play a key role in interpretive and informational planning under the Washington Coastal Corridor planning project, which is funded by Intermodal Surface Transportation Efficiency Act of 1991.

In addition to telling the dam removal story for visitors, a visitor center on Highway 101 would help the Park by restoring a visitor contact function that was lost when the Barnes Point highway bypass resulted in the loss of a visitor contact facility on Highway 101. This facility would also provide orientation information to visitors visiting the Lake Crescent, Elwha, and Sol Duc Valleys of the Park and would help avoid problems at beach areas such as Ozette Lake and Shi Shi Beach. It would also provide interagency tourist information traveling both west and east from this point.

Although limited by local terrain, location of this facility is somewhat optional. The Center could be located on lands designated as trust territory for the Lower Elwha S'Klallam Tribe. If so, the facility would enhance the Tribe's proposed commercial enterprises in that area. The facility could also be placed on lands associated with a fish refuge or on nearby purchased private lands.

C. FACILITY OPTIONS

1. Visitor Center. Ideally, the scale of such a facility would be comparable to the Olympic National Park Visitor Center in Port Angeles or the proposed Kalaloch Visitor Center. Along with the representatives of the rest of agencies who are familiar with this proposal, the staff of Olympic National Park supports this proposal. However if the Park must choose between this center and one proposed at Kalaloch, which is also strongly supported by the local community and would be interagency in nature, the Park would place priority on the Kalaloch Center. Both visitor centers are supported by the OPIN preplanning group.

Estimated cost $6,000,000 - $7,000,000

2. Visitor Contact Station. A somewhat lesser visitor contact station could be built with moderate exhibits and staffed seven days a week at least 6 months of the year.

Estimated cost $3,000,000 - $4,000,000

3. Minimal Building. A minimal building with some offices and storage space and a small visitor lobby could be built and staffed as above.

Estimated cost $1,200,000

4. Exhibit Shelter. An exhibit shelter, similar to those recommended at the dam sites, could be built. The restrooms should probably be more expansive and a turning lane for safe access would need to be provided. This would serve as a "mini rest stop" and still draw visitors to the Elwha economic area and, to some extent, help orient visitors.

Estimated cost $500,000

5. Combination. A combination of Option 4 and one of the cheaper options preceding it could be accomplished.

Estimated cost $1,200,000 to $4,000,000

6. Sweets Field. Should an interagency visitor contact facility on Highway 101 not be feasible because of conflicts of land use, Options 3 or 5 could be implemented at "Sweets Field" within Olympic National Park in the Elwha Valley. However, this location is less desirable because it is several miles from Highway 101 so would not attract and serve as many passing motorists.

Estimated cost $750,000 - $1,200,000

Regardless of the option chosen, tours operated in conjunction with Clallam County Transit or private vendors would be encouraged. Visitors could be picked up at the Port Angeles/Victoria ferry terminal and brought on site. Such tours might be tied in with tours to other locations in the Park, the Olympic Park Institute, a Lower Elwha S'Klallam Tribe long house on Ediz Hook, or other attractions.

Because the effect of dam removal is so complex and affects a large area, several additional interpretive sites should also be considered, including (1) the former site of Lake Aldwell, possibly near the current boat launch site, (2) hiking trails through the restoration areas at both impoundments, (3) a hiking trail through the project area linking the City of Port Angeles' waterfront trail to trails within Olympic National Park, (4) overlook sites at identified anadromous fish spawning locations, and (5) an interpretive display at the Olympic National Park Visitors Center in Port Angeles.

The variations are probably endless, although the main points remain the same (i.e., interpretation of four major themes at four or more major sites). Although the dam sites might seem to be the most important, their distance from the main highway routes will limit public use unless a suitable and effective means of channeling visitors to the interpretive sites is established. Past experience tends to indicate that a highway based primary interpretive site would be the most important single component of this effort.

D. EXPANDED DESCRIPTION OF INTERPRETIVE OBJECTIVES

Some thrusts of the interpretation, not in priority order, are listed below.

1. To describe to some degree the physical and operational characteristics of the dams, including dimensions, megawattage generated, and sizes of impoundments.

2. To describe the processes associated with the removal of the dams in terms of:

   a. attempts to minimize impacts during removal;

   b. the groundwork layed for a return to natural conditions; and

   c. the scale of the work and technology associated with the enterprise.

3. To discuss in an objective and nonjudgemental manner changing resource management values as our scientific knowledge has increased and certain resources have become more scarce including:

a. local governmental and fish hatchery concerns about clean water;

b. power needs of the Daishowa America Mill;

c. National Marine Fisheries Service's role in maintaining a viable commercial and recreational offshore fishery;

d. U.S. Fish and Wildlife's role in maintaining wildlife habitat, fisheries restoration, and recreational fisheries;

e. the National Park Service's role in preserving and interpreting natural systems;

f. the Lower Elwha S'Klallam Tribe's role in cooperative resource management and balanced use; and

g. the role and cooperative efforts of related state agencies.

4. To discuss the geological and biological dynamics associated with the construction and removal of the dams in terms of:

a. geological changes such as (1) gravel transport and deposition patterns, related topographical changes from braiding, side channel formation and woody debris deposits, spawning gravel formation, and effects on Ediz Hook, and (2) stream flow, turbidity, and water temperature effects on fish;

b. roles of anadromous and resident (non-anadromous) fish including the fact that the Elwha River is one of a few river systems that historically supported all the Pacific Northwest anadromous salmonid species;

c. plant community responses and succession patterns during natural revegetation and man's efforts to mimic nature's patterns;

d. related impacts on other wildlife, including the role of fish carcasses in providing nutrients to aquatic and riparian zones and wildlife responses to changing habitats;

e. the value of wildness and preservation of genetic stocks; and

f. discussing a time line for expected restoration to occur.

5. To discuss the cultural impacts, especially from a Native American perspective, associated with the construction and removal of the dams, including:

a. the S'Klallam Creation Site under Lake Aldwell;

b. the history of S'Klallam Village at the confluence of Indian Creek and the Elwha River;

c. treaty rights and the traditional dependence upon the Elwha River for subsistence; and

d. the spiritual value of the river ecosystem as the heart of S'Klallam culture.

III. OPERATIONAL NEEDS

Although independent interpretive shelters and self-guided hikes would be important components of any interpretive program, such an effort would be incomplete without staffing to provide programs, guided hikes, and to answer the myriad of questions that will arise. The following staffing would meet that need:

One GS 7/9 time interpretive supervisor	$37,500
Two full time GS 5 Naturalists	51,000
Four GS 4 six month positions.	39,500
Est. subtotal	128,000
Plus approx. 5% support costs	7,000
Total	135,000

It would be helpful if special legislative authorization made it permissible to preferentially hire half of these positions from Native Americans.

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APPENDIX K

ELWHA RESTORATION STUDIES

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APPENDIX K

ELWHA ECOSYSTEM RESTORATION STUDIES

Public Law 102-495 affords a unique opportunity to monitor and evaluate changes to a large river ecosystem resulting from the removal of two large dams and the restoration of native anadromous fisheries. Measures of existing geological, hydrological, and biological components of the ecosystem must be collected to provide a comparison to the restored ecosystem. The proposed studies would provide for the assessment of how ecosystems respond to restoration efforts, techniques for restoring severely depleted fish stocks, and the response of fish to altered stream conditions following man-caused perturbations. Surveys of existing conditions should be initiated as soon as possible to generate a database that includes measures of interannual variations in natural processes. Designs of studies of existing conditions must be consistent with the long-term database needs for evaluations of the restored ecosystem.

1. Anadromous Fish

a. Conduct gill netting in the lower river to determine the entry timing and abundance of spring chinook salmon (*Oncorhynchus tshawytscha*) and late winter and early summer steelhead (*O. mykiss*). This study is currently being conducted by the U.S. Fish and Wildlife Service (FWS) and the Lower Elwha S'Klallam Tribe (Tribe) through 1995.

b. Conduct spawning ground surveys and genetic stock identification (GSI) sampling for chum salmon (*O. keta*). The native stock has declined and non-native fish have been planted in prior years. This study, which was begun by the FWS and Tribe in 1993, would provide an assessment of the existing stock and data regarding the genetic influence of prior plants of non-native fish.

c. Conduct spawning ground surveys and GSI sampling for the severely depleted stock of Elwha pink salmon (*O. gorbuscha*). Questions remain whether the few remaining fish are native to the Elwha or are strays from other river systems. GSI sampling should provide some information that will be useful in determining whether the remaining fish should be used for broodstock or whether it may be acceptable to import another stock. The spawning surveys should be conducted each pink return year (odd numbered years).

d. Determine annual returns of naturally spawned summer/fall chinook, coho (*O. kisutch*) and sockeye (*O. nerka*) salmon prior to and following removal of the dams. Estimates are currently generated by the State and Tribe, but refinement of these estimates is desirable.

e. Determine ability of resident rainbow trout (*O. mykiss*) to resume anadromous behavior and serve as broodstock for steelhead restoration. This study is currently being conducted by Olympic National Park and the Tribe and is scheduled through 1996.

f. Conduct a fish habitat (wetted area, woody debris, and pool/riffle area) assessment of the Elwha River from Glines Canyon Dam to tidewater. This assessment should be conducted once before removal of the dams and periodically following removal.

g. Determine spawning and rearing potential for sockeye salmon in Lake Sutherland. Assess opportunities for enhancement.

2. Resident Fish

a. Assess fish community structure (species, population sizes, distributions) in upper, middle, and lower river and establish monitoring indices. This study should be conducted biannually before and following dam removal.

3. Aquatic Invertebrates

a. Inventory aquatic invertebrates in upper, middle, and lower river and establish monitoring sites and indices in each section of the river. This study should be conducted biannually before and following dam removal.

4. Riparian Plant Communities

a. Inventory riparian plant communities from the mouth of the river to the upstream limit of anadromous fish migration. This inventory should occur once before removal of the dams and every five years following removal.

5. Water Quality

a. Compile existing information regarding temperature, dissolved oxygen, turbidity, and streamflows. Initiate a monitoring program for each of these factors in the upper, middle, and lower river sections.

6. Sediment Transport and Stream Channel Morphology

a. Describe substrate composition, depth, and channel width across representative transects in the middle and lower river to tidewater. A measure of sinuosity for the entire affected river should also be collected. This characterization should occur once before dam removal and biannually following removal. Measures of streamflow necessary for this study should be collected consistent with study 5a.

b. Model bed load redistribution and reworking, and the effects on downstream bed sediment delivery, including the marine environment.

7. Marine and Estuarine Resources

a. Map the physical and biological features (i.e., vegetation and shellfish) of the estuary and reservation beaches. This assessment should be conducted annually.

8. Wildlife

a. Conduct population surveys for osprey, red-tailed hawk, bald eagle, merganser, and otters and establish monitoring indices. This study should be conducted biannually before and following dam removal.

b. Radio-tag elk to determine seasonal movements and migration patterns. This study should be conducted for two years prior to dam removal and periodically following removal.

9. Cultural

a. Restoration of anadromous fish will provide additional harvest opportunity for the Tribe. As well, religious and culturally significant sites will be uncovered. The impacts of these effects to the Tribe should be fully assessed.

10. Economic

a. Restoration of the Elwha ecosystem should result in increased tourism, recreational and commercial fishing opportunities, and short-term economic growth associated with dam removal activities. The impacts to the local (City and County) economy should be assessed.

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APPENDIX L

IMPACTS TO CULTURAL RESOURCES

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APPENDIX L

IMPACTS TO CULTURAL RESOURCES

I. CULTURAL RESOURCES

The Elwha S'Klallam have lived in and utilized the river basin for thousands of years. Villages and fish camps, tribal history, and tribal culture are all integrally connected to the watershed and the river system. Although there are several areas of particular significance to the S'Klallam within the Elwha Valley (and particularly within the Lake Aldwell project area), the S'Klallam inhabited a sizable area and have strong cultural and spiritual ties to the entire ecosystem. The river system was accorded immense respect. The river was the heart of the S'Klallam's ceremonial, cultural, and spiritual existence and the watershed provided the resources necessary for sustenance and lifeways. In this way, the entire river is a cultural resource.

There are four areas of special meaning within the general project area, in addition to village sites, seasonal camps and other named sites. While the general locations are known, the accuracy of mapping such sites would be inexact. Anthropologist Dr. Barbara Lane is researching cultural resources of the Elwha valley. Jacilee Wray, anthropologist at Olympic National Park, is preparing a document outlining S'Klallam use of the Park area. Tribal Cultural Resources staff are continuing to work with tribal elders on identifying significant areas. More information will become available as these projects are developed.

A. SITES OF SPECIAL SIGNIFICANCE

1. **Thunderbird's Home**. Many S'Klallam stories mention Thunderbird, who provides extraordinary spiritual power, and place his home within the valley. Thunderbird is a powerful figure, accorded much respect.

2. **Creation Site**. The spot where the Creator formed the Elwha people is presently inundated by Lake Aldwell. There is also an area nearby, below the Olympic Power Company's plant, where the Creator originally tried to form the people, but decided to move on to the Creation site now under water.

3. **Cleansing Site**. Also presently under Lake Aldwell. It has also been named "where they bathe" and described as a place where people went to purify themselves and receive spiritual guidance.

4. **Prophecy Hole**. This is a spot just above the Elwha dam, where S'Klallam people went to receive guidance and get a glimpse of their futures.

5. **Villages/Seasonal Camps/Smokehouses**. An Indian village with permanent housing and both permanent and seasonal residents was located near the confluence of Indian Creek. Another settlement was reported some twenty miles inland by anthropologist Erna Gunther. Seasonal hunting and fishing camps were located on the river near the mouth of Boulder Creek, and on Hayes river in the upper Elwha. Smokehouses were documented on Little River and Indian Creek, and above Glines Canyon near what is now Lake Mills.

6. **Burial Areas**. Burial grounds are associated with all permanent villages, although their exact locations are unknown. A single grave, indicative of war or disease, containing S'Klallam relics and more than 40 skeletons was found on the Lower Elwha.

B. OTHER NAMED SITES IN PROJECT VICINITY

1. "**Esna'wlL**". "Enclosed by a canyon". The site of the Olympic Power Company.

2. "**Tcitsq!o's**". "Place where there are holes in the face of the rock". Near the power plant.

3. "**Tea pe'tsln**". "Mouth of the steep place". Vertical cliff near the power plant.

4. "**Cate'a'i**". "Where one pounds sinew on a rock". A boulder above the cliff, where sinew may have been made in sinew rope.

5. "**Sa iyo'qtEn**". "Where they bathe". Above the power plant.

6. "**TestctL!exEd**". Diminutive of "hell". Above the fork of Indian Creek.

C. SIGNIFICANT SITES OUTSIDE OF THE PROJECT AREA

1. **Power Sites**. Far up in the mountains are basins with water which gave the Elwha Klallam a mysterious power over other Indians, allowing them to call people from long distances. The S'Klallam also used a "talking power" to persuade their own longhouse poles to lengthen or shrink.

2. **Indian Homesteads**. Following European contact, several Indian homesteads were patented within the river valley.

3. **Seasonal Camps**. In the mountains above Lake Mills, there are several specific sites where Klallam families established seasonal camps for hunting, fishing and gathering of plants and berries.

4. Cable Ferry. During reconstruction of the Elwha Dam, an Elwha tribal member ran a cable ferry across the river, at the Lower Elwha Wagon Bridge location.

II. ARCHEOLOGICAL RESOURCES

Archeological remains in the Elwha Valley were probably not extensive, even before construction of the dams. Villages and seasonal camps are usually found in well protected areas with relatively easy access to fish. These areas also tend to be geomorphically dynamic. Located along the water's edge, they would be subject to cyclical flooding and erosion as the Elwha River was constantly cutting its banks and redepositing its sediment load. This type of dynamic landscape has been documented on other rivers to change every hundred years or so. Sites would have been swept away as the river changed its course. Thus, the oldest remaining archeological deposits may be less than two hundred years old.

Artifacts associated with such sites testify to their use. Most would consist of wood, bone and shell remains. In many cases, the presence of shell would contribute to a shift in soil chemistry, changing the highly acidic forest soil to a more basic soil in which bone and shell artifacts would survive. At other sites, the acidic nature of the soil would result in many artifacts disappearing, leaving only charcoal and maybe fire cracked rocks.

Construction activities would have created further damage to sites in the immediate vicinity of the dams. Historic photos show clearing and alteration of the landscape. The rapid release of water from the failure of the Elwha Dam foundation would have eroded stream confluences and other areas. Construction associated with the rebuilding of the dam involved massive blasting of bedrock cliffs. Each of these actions could have reduced the number and integrity of archeological sites in the valley. Thus, by 1913, there may have been limited archeological materials remaining in the project areas. Those that did remain would have been buried by the massive amounts of sediment that have been laid over the bottoms of the reservoirs.

III. HISTORIC RESOURCES

Both the Elwha and Glines Canyon projects were listed on the National Register of Historic Places in 1988 as a result of a statewide study and evaluation of hydroelectric projects. As described by Soderberg (1988), the Elwha River Hydroelectric Power Plant is:

> a historically significant example of a low head hydroelectric system in Washington State from the early 20th century....the dam is a rare, early example of the multiple-buttress

> type...the "blowout" and reconstruction of the original dam foundation is noteworthy because it represents a failure of early engineering and a successful response to that failure.

Soderberg (1988) attributed the significance of the Glines Canyon Power Plant to:

> its association with the evolution of power plant design and contributed to the development of the automation of hydroelectric installations....as one of the last dams within the state to be constructed solely for the purpose of power generation, it marks the closing of an era which characterized early hydroelectric development within Washington State.

The evaluation of the historical significance of both dams ended with similar statements which referenced the long debate over the destruction of the upstream fisheries that resulted from the dams' construction:

> Although construction of the facility [Glines] represented a significant achievement for the utility, the project provided no mitigation for the serious loss of fish runs, the inundation of wildlife habitat, or the disruption to the traditional cultural and subsistence economy of the Lower Elwha and Jamestown tribes. Any assessment of the historical impact of this plant must recognize the damage inflicted on both the native inhabitants and the natural environment.

IV. RECOMMENDATIONS FOR TREATMENT AND/OR MITIGATION

A. CULTURAL RESOURCES

The river ecosystem itself is a cultural resource of immense value to the Elwha S'Klallam. Restoration of the free-flowing river and its attendant wildlife and fish habitat would mean a revival of the cultural values that were impaired by dam construction. Restoring the cultural milieu is a different task than conducting archeological surveys or documenting characteristics of a physical structure such as the dams. The cultural resource that is the Elwha River ecosystem would be restored as habitat and fisheries restoration occurs, and as the Elwha S'Klallam are able to return to the area to practice traditional activities upon which their culture was formed, including fishing, hunting, gathering of natural resources and the practice of their traditional resource focused spirituality.

Interpretive programs that help foster cultural awareness among visitors to the area, tribal members and other local residents would also help to increase recognition of the river's worth on a holistic level. The ethnographic study proposed in the following section would help further develop the concept of the area as a cultural resource, identify specific areas of significance because of their role in spiritual practices and cultural identity, and help promote an understanding of the historical and cultural link between the S'Klallam people and the Elwha River system. This educational effort would also stimulate an awareness among non-S'Klallam people of not just the biological and physical value of a river ecosystem, but also its capacity for spiritual and cultural value among all peoples.

B. ARCHEOLOGICAL RESOURCES

In the years since dam construction, massive amounts of sediment have effectively buried any remaining archeological deposits behind the dams. The archeological survey of the current reservoir bottom would tell very little about the earlier landscape, much less yield any archeological sites. Consequently, it is not surprising that a previous cultural resource survey of the valley did not locate any significant prehistoric or historic archeological sites (Wesson and Welch 1987), even though ethnographic accounts of Native American use in the valley identify as many as twelve locations on the lower river, including a major village on the west bank and at the confluence of both Indian Creek and Little River. Another major village is reported for the south end of Lake Mills.

If the dams are removed, the recommended course of action to protect archeological sites during and after dam removal would be to monitor the reservoir as the river cuts down the sediments that layer the reservoirs' bottoms. The most prudent action would be to survey the bottoms after the dams have been removed and for a 5 to 10 year period afterwards. Spring and fall surveys should be conducted of the stream and river banks as the river reestablishes its watercourse. If archeological materials are encountered, they would have to be tested to determine if they were significant and what actions should be taken to preserve or recover the information in the sites.

Archeological survey to document and prepare a report on the archeological resources within the project area of effect. Based on using the equivalent of a GS-9 archeologist for 9 months and two GS-7 archeologists for 5 months each, plus 30% support costs.

Cost Estimate: $55,000

Archeological surveys for a 5 to 10 year period following dam removal.

Cost Estimate: $15,000/yr

Ethnographic survey to document and prepare a report on the ethnographic resources within the project area of effect and an ethnohistorical study to record locals' memories. Based on using the equivalent of a GS-9 ethnographer for 6 months plus 30% support costs

Cost Estimate: $29,400

C. HISTORIC RESOURCES

Initial informal consultations with the Washington State Office of Archeology and Historic Preservation, which prepared and submitted the nominations for both dams, indicate that the Office continues to recognize the impacts of the dams on both natural and other cultural resources, as well as the potential need to remove the dams to restore the fisheries. If removal of the dams in their entirety is approved, further consultation on appropriate mitigation would be required. Components of any mitigation project include documentation of the projects in their entirety to the standards of the Historic American Engineering Record to prepare a permanent record that would be maintained in the Library of Congress. This documentation would include a history of the project, measured drawings of designated features, photographs, and archival copies of important engineering records and drawings. Other forms of mitigation could include providing for on-site (or within the park) interpretation of the projects through a mixture of interpretive device and techniques.

Historic American Engineering Record documentation of the dams plus associated structures (Level 1 = measured drawings, historical report, photographic documentation).

Cost Estimate: $100,000

A camera system to record dam removal activities by taking regular-interval photographs.

Cost Estimate: $20,000

III. CONCLUSIONS

In Section 106 of the National Historic Preservation Act, Congress provided a means for Federal agencies, in consultation with the Advisory Council on Historic Preservation, to evaluate the effects of their proposed undertakings on cultural, archaeological and historic resources eligible for or listed on the National Register of Historic Places. However, Section 106 does not explicitly or implicitly ensure the preservation in perpetuity of any of these resources. The purpose of Section 106 is to ensure that the significance of these resources be taken into account in the balancing act of competing interests and needs that defines the final equation of all planning and management decisions. Section 106 does not recognize the cultural significance of resources not eligible for listing on the National Register, and it fails to provide a mechanism for evaluating the significance of natural areas as cultural resources.

The process of inventory, evaluation and development of treatment recommendations reflected in this discussion of cultural resources is consistent with the requirements of Section 106 and consultations would continue with all affected parties. Based on the results of this process to date, however, it is our conclusion that significant information about the dams could be preserved through the Historic American Engineering Record if they are removed. There is also the possibility that other cultural resources, both archeological and ethnographic, could be enhanced following dam removal. As indicated in the above quotation from the National Register nominations for the dams themselves, the enormous significance of the restored fisheries to contemporary populations and the river system is a legitimate and worthy counterweight to the loss of the dams in the final management equation.

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APPENDIX M

AGENCY AND PUBLIC COMMENTS

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APPENDIX M

AGENCY AND PUBLIC COMMENTS

Approximately 200 members of the public attended an Open House that was held in the Port Angeles High School Library on October 18, 1993. The Open House provided the public an opportunity to query the developers of the Elwha Report in their areas of expertise. Comments made by the public were recorded. A written comment period was also provided following release of the Public Review Draft of the Elwha Report on October 4, 1993, till November 8, 1993. The Elwha Report has been modified where necessary based on the comments received. Copies of the comment letters are included herein.

Many of the questions/comments were similar in nature and have been summarized below. Responses to each of the questions/comments are included.

Question/Comment 1: More time needs to be provided to comment on the Elwha Report.

Response 1: Given the length of the report and the amount of information contained therein, we can understand the desire for more time. However, Public Law 102-495 requires submission of the Report to the Congress by January 31, 1994. There simply is not enough time to allow for an extended comment period and still meet the mandated deadline. However, additional public involvement will be essential during development of an Environmental Impact Statement (EIS) on dam removal if the decision is made to fully restore the Elwha River ecosystem and native anadromous fisheries.

Question/Comment 2: The conclusion that the dams must be removed to fully restore the ecosystem is biased.

Response 2: The conclusion that the dams must be removed to fully restore the Elwha River ecosystem and native anadromous fisheries is based on many years of scientific analysis and is consistent with studies conducted by the Federal Energy Regulatory Commission (FERC) and the General Accounting Office. It simply is not possible to restore the native anadromous fish, habitat, and natural ecosystem processes as long as the dams remain on the Elwha River.

Question/Comment 3: The validity of the analysis of fish passage measures in meeting the goal of full restoration is suspect, particularly because of a perceived lack of consultation with the Army Corps of Engineers (ACOE).

Response 3: The National Marine Fisheries Service (NMFS) and the

Washington Department of Fisheries (WDF), both agencies with fish passge expertise, were intimately involved in the FERC licensing proceeding where fish passage measures were evaluated. FERC's conclusions, based on input from these agencies, were largely included in Section V (Consequences of Alternatives) of the Report. NMFS and WDF were further consulted during the Report process. The ACOE was also consulted, and a copy of their comments is included.

Question/Comment 4: The loss of habitat provided by the two reservoirs will result in impacts to wildlife, including species such as the trumpeter swan, bald eagle, osprey, beaver, great blue heron, and harlequin duck. Will those species that depend on lake habitat be sacrificed for those that depend on riverine habitat?

Response 4: While the removal of the dams and reservoirs may adversely impact a limited number of species and result in a decline in their abundance, restoration of the Elwha River is considered to be largely beneficial for most wildlife. A few species with highly specialized feeding strategies, such as the trumpeter swan (which is native to the region) and osprey, may be impacted by the loss of shallow water habitat with submerged aquatic vegetation and large open water habitat, respectively. Except for the delta regions, the two reservoirs are deep and have very steep shorelines, which provide very little of the more productive littoral zone. The restoration of the physical, hydrologic, and biological processes that would result from the removal of the dams is expected to replace or enhance most of the functional values presently provided by the reservoirs. Further analysis of impacts (positive and negative) to wildlife and potential mitigative measures will be conducted during development of the EIS/advanced planning report.

Question/Comment 5: Will the removal of the dams result in a loss of wetlands?

Response 5: It is expected that there will be a net increase in wetlands following dam removal. The removal of the projects, including the control and stabilization of accumulated sediments, may result in the loss of some existing wetlands because of changes in topography and hydrology. However, the restoration of natural fluvial processes should result in the formation of new or the expansion of existing wetlands along some sections of the restored river channel. In addition, opportunities for creating wetlands in the former reservoir areas will be explored in connection with sediment stabilization efforts. The above issues will be addressed in greater detail during development of the EIS/advanced planning report.

Question/Comment 6: How can dam removal be done without impacting spotted owls?

Response 6: The timing and nature of removal activities will be designed to minimize impacts to any spotted owls that may occur within the project area. In the long-term, the impact of project removal will be beneficial since it would result in an increase in potential foraging and nesting habitats.

Question/Comment 7: What is the rationale for altering existing habitat? The dams have created a modified ecosystem for 80 years and removal will change that.

Response 7: From a biological basis, the potential benefits of removing the dams to restore the Elwha River ecosystem far exceeds the negative impacts associated with the loss of habitats artificially created by the two reservoirs. Because of their depths and deep shorelines, the two reservoirs are relatively unproductive and they prevent the full restoration of anadromous fish runs.

Question/Comment 8: If the Elwha Project lands are held in trust for the Elwha Tribe, the lands could be logged for short-term profit. Also, is the Tribe's proposed gambling casino going to have an impact on the restoration project?

Response 8: Elwha tribal land use policy, especially regarding property associated with Elwha River restoration, prioritizes the protection and restoration of the river system and fisheries, consistent with P.L. 102-495. The Tribe does not plan to manage Elwha Project lands for profit at the expense of the natural resource. Long-term rotation (i.e., large-scale, clearcut logging) is not being considered by the Tribe as a management option. The Tribe will develop a forestry management plan that advocates progressive and alternative practices that safeguard the forest ecosystem and aesthetics while providing a small amount of yearly, sustained income for those uplands not directly within the central river corridor. The central river corridor within the project boundaries, about 60% of the Elwha Project lands, would be protected.

The Elwha Tribe's proposed casino project is unrelated to the restoration project and will, in all likelihood, be constructed and operating before river restoration proceeds to the point of project land disposition and dam removal. Location of a proposed casino site has not yet been determined, but will occur within a year.

Question/Comment 9: What are the major issues involved with removing the accumulated sediments and how much will it cost? What are the advantages and disadvantages or relocating the sediment on-site and what are the disadvantages of letting the sediment wash down river?

Response 9: The major issues involved with managing or removing the sediment are how and where to relocate the trapped material in order to create a path for the river. A range of costs were developed associated with nine separate approaches to sediment management. These costs ranged from $50 to $194 million (see Section VI.C.2).

Major advantages and disadvantages are related to costs and impacts on the river and surrounding environment. Cost advantages were gained from approaches that moved or handled the smallest quantities of material. For example, allowing the river to transport material (Scenario 7) instead of removing it with mechanical equipment resulted in the lowest cost. Relocating only the material in the immediate path of the river to a location adjacent to the river (Scenario 5) also resulted in a relatively low cost. Moving the material away from the reservoir areas resulted in the largest projected costs.

Both the *Removal* and *Retention* sediment management approaches would result in only minor impacts to the river system during dam removal process because only small quantities of sediment would be introduced into the river. The *Erosion* approach would have significant impacts on river water quality during the removal process due to high turbidity. Protection or relocation of river water sources during removal would be required for the *Erosion* approach.

Question/Comment 10: Where will the trapped material be located after dam removal? Does the sediment have any economic value?

Response 10: The *Removal* approach would locate both fine material (silt and clay sized particles primarily located in the reservoir bottoms) and coarse material (sand and gravel sized particles primarily located in the reservoir deltas) to a distant site. Locations in saltwater and on land were identified as possible sites during the FERC licensing process. Saltwater sites could be in the ocean or at an approved site within the Puget Sound region. A potential upland site identified in the FERC process was west of the Elwha at the base of Kelly Mountain. No investigation of other upland sites has been conducted. However, if material were transported to an upland site, investigation of the local geology and potential environmental impacts would be required. In the *Retention* approach, the material would be relocated immediately adjacent to the river in the area that is now the reservoirs. The *Erosion* approach would allow the material to wash downstream.

The economic value of the trapped material is unknown. Potentially, this material could be sold for fill or landscaping use. Most river rock has rounded edges and would probably have to be crushed for use in concrete or as road ballast. However, some of the river rock could be placed in the river to accelerate the recovery of spawning areas. This option, and other potential beneficial uses of the sediment, will be explored further in the EIS/advanced planning report.

Question/Comment 11: What impacts will heavy equipment used in the dam removal process have on the local environment?

Response 11: Heavy equipment, to some extent, will be required regardless of the approach used. More equipment and greater resulting impacts would occur in the upland disposal *Removal* approach (Scenario 1). For this approach, roads leading from the reservoirs to the disposal site would have to be widened and upgraded. The extent of the effect of the noise and effects on air quality would depend on the disposal site and equipment used. If heavy equipment were used to relocate the sediment in the *Retention* approach, some noise and air quality impacts would be anticipated. However, no significant roadway impacts would be expected. Other approaches use dredging procedures or river flow to excavate and transport materials, so probably would not require major roadway upgrades.

Question/Comment 12: How will relocated material be stabilized?

Response 12: Stabilizing material would be required only for the *Retention* approach. Other approaches would remove material from the river area or allow natural redistribution along the length of the river. In the *Retention* approaches, material is removed from the path of the river and relocated adjacent to the river along the banks. Fine grained material (silt and clay) would be stored in cells, up to 40 feet deep, constructed from coarse material. The outer cell wall would be constructed by depositing coarse material in layers to form berms (dikes).

Larger material would be placed on the outer face of the walls along the river to reduce river scour potential. The extent, nature and availability of rip-rap or large sized material required for scour protection has not been determined. Scour protection design would depend on landscaping requirements, design flood, desired degree of material stability, and aesthetic considerations. Full scour protection should be possible, however, with or without extensive rip-rap. Bioengineered stabilization methods will be further explored during development of the EIS/advanced planning report.

Revegetation of the stored material would be accomplished using a variety of plant species, although native species would be favored. A preliminary list of easily-propagated species has been developed. A series of empirical growing trials, using both amended and unamended reservoir sediment material, would be undertaken prior to the final selection of plant species for revegetation.

Depending on the final reservoir sediment management scenario selected, immediate stabilization would begin as soon as possible following drawdown, exposure, and drying of sediment material. In the first phase, the project would use direct and aerial seeding of rapidly growing, early-succession species such as grasses. Native grasses, or sterile non-native varieties, would be used within Olympic National Park. A variety of other available erosion control techniques may also be used to augment these plantings, including mulches, geotextiles, chemical soil stabilizers, etc. Concurrently, the control of invasive, noxious exotic plant species would be necessary to permit initial revegetation efforts to succeed (see also Section VI.H.6).

Question/Comment 13: What is the makeup of the fine material on the reservoir bottoms?

Response 13: The fine material (silt and clay) is very low in nutrients required for plant growth (see Table 11). For this reason, the *Retention* approaches show this material buried beneath a surface layer of coarse material. Coarse material in the delta areas currently supports growth of deciduous trees. Further investigations into the details of sediment revegetation will be undertaken during the EIS and advanced planning stage.

A sample of the fine material was tested against very stringent criteria used for dumping dredge spoils in Puget Sound waters. This test indicated that the fine material was suitable for disposal at a designated dredge spoils site. No chemical or biological contaminants were found.

Question/Comment 14: What effects will dam removal and the restoration process have on the river and related water users?

Response 14: Dam removal will increase the amount of material flowing down the river. Currently, the dams trap an average of over 200,000 cubic yards of material each year that would naturally be transported by the river if the dams were not in place. Approximately 2/3 of the trapped material is sand and gravel. Dam removal would result in the replenishment of the sand and gravel currently missing from the lower reaches of the river. In addition, studies indicate that some of this material would have been deposited on or near Ediz Hook.

Section 4 of P.L. 102-495 provides that implementation of any plan to remove the dams shall provide for the protection of the water supplies for the municipal and industrial users of Elwha River water (specifically, the City of Port Angeles, ITT Rayonier, Daishowa America, and the Dry Creek Water Association). Methods are available for supplying high quality water to the mills and other users, although further study during the advanced planning effort is required to determine the best method. Consequently, the operation of the mills should be unaffected by dam removal.

The quantities of sediment introduced into the river during dam removal would depend on the approach used. The *Retention* and *Removal* approaches would introduce only very small quantities of fine material into the river. The *Erosion* approach would greatly increase the quantity of suspended and bedload material. There is a direct correlation between each of the sediment disposal alternatives and the cost of water quality measures necessary to protect the water users from the associated turbidity levels. Mitigative measures (e.g., timing sediment releases during less critical time periods, captive broodstock programs) for the existing Elwha River anadromous fish stocks would be contemplated if the *Erosion* approach was ultimately selected.

Question/Comment 15: What does the Ranney collector do to the water?

Response 15: The City of Port Angeles' Ranney collector intercepts water seeping through the sands, gravel, etc. comprising the bed of the Elwha River. These river bed materials can filter out suspended sediment in the water, thus improving the quality of the diverted water.

Question/Comment 16: Concerns about impacts to well water users following dam removal.

Response 16: The potential sediment impacts dam removal could have on wells located along the river will be identified as part of the detailed studies to be accomplished as part of the preparation of the EIS/advanced planning report. These studies will identify all water users that could be impacted and appropriate mitigation measures, including alternate sources of supply. Any proposed water treatment methods would have to meet Federal and State standards for safety. The provision of a contingency fund to pay for the mitigation of delayed impacts on wells as a result of dam removal will be included in the evaluation.

Question/Comment 17: Landowners along the river are concerned about increased flooding following dam removal.

Response 17: The existing projects are not operated for flood control but rather as run-of-the-river facilities. Accordingly, they provide extremely limited flood control protection. Nevertheless, removal of the dams would allow the natural accretion of sediments in the river bed to occur once again, thereby raising the bed elevation in some areas and thus elevations of flood events. The potential for increased flooding below Glines Canyon Dam and appropriate mitigative measures will be examined in greater detail as part of the detailed studies associated with the preparation of an EIS/advanced planning report on dam removal. The Army Corps of Engineers will be closely consulted, and may in fact do much of the analysis, on this issue.

Question/Comment 18: There must be public access to the river from the project lands.

Response 18: Although specific access points have not yet been identified, it is the intent of the Department of the Interior to provide public access to the river from the project lands acquired pursuant to P.L. 102-495. Additional analyses of recreational impacts and opportunities resulting from dam removal will be conducted during development of the EIS/advanced planning report.

Question/Comment 19: General concerns about over-harvest, high seas interceptions, and impacts of sea lions.

Response 19: Over-harvest threatens many salmon stocks. Consequently, efforts are underway to rebuild anadromous fisheries within the region, not just the Elwha River. For example, Treaty Tribes are pursuing the inclusion of Strait of Juan de Fuca (SJF) salmon stocks in the Pacific Fisheries Management Council (PFMC) harvest planning process for 1994 and beyond. In addition, the Pacific Salmon Treaty is being re-negotiated with Canada, including the consideration of harvest issues in the SJF region. Further, the high seas interceptions of U.S salmon have decreased following the closure of drift net fisheries by other countries. Please see Sections II.C.3.l-m for additional harvest management information.

Regarding marine mammals, there is no evidence that seals or sea lions are intercepting significant numbers of Elwha River fish. Such problems usually occur in areas of constrictions to salmon and steelhead migrations, such as at the Ballard locks in Seattle.

Question/Comment 20: Many individuals voiced a concern that Indian fishing, specifically in-river fisheries using nets, will prevent full restoration of anadromous fish.

Response 20: The U.S. v. Washington Federal court decision ("The Boldt Decision" of 1974) governs the fish harvests allowed by Native Americans. This decision prescribed that the State of Washington, the Federal government and Treaty Tribes must work together to determine run sizes, escapement goals (the number of spawners needed to perpetuate the run) and allowable harvests for each river system subject to treaty Indian fishing. After determining the run size and subtracting the spawning escapement needs, the remaining fish are divided equally between Indian and non-Indian fisheries. Each party may take these fish in the area and manner of their choosing so long as it does not exceed their share or interfere with the opportunity of the other party.

The first priority in the management of salmon and steelhead fisheries is always the spawning escapement requirement. In some river systems, escapement requirements are directed towards a hatchery and not the numbers of fish needed to seed the available habitat. Once the escapement and harvestable shares are determined and the seasons set, the Washington Department of Fisheries and Washington Department of Wildlife monitor tribal catches to ensure the quota or share is not exceeded. In some cases, tribes close their seasons without taking their share because of a conservation concern.

Question/Comment 21: Why not save all the expense of dam removal and fish passage and just build another hatchery or fish pens? The fish can be grown larger, fatter and healthier under a controlled environment for commercial use.

Response 21: The Pacific Northwest and the Elwha River are currently very dependent on hatchery programs to sustain fishing for chinook, coho, and steelhead. Within the lower five miles of the Elwha River there are already two hatchery facilities: the Lower Elwha Tribal Hatchery and the Washington Department of Fisheries's Elwha Rearing Channel. The tribal facility has had variable success in producing coho and winter steelhead. Despite large plants of these species, catches fluctuate widely and have been relatively low in recent years. The Rearing Channel only releases chinook salmon and, although they are caught in substantial numbers in marine fisheries, there has not been any recreational fishing in the river and only very limited tribal fishing for this species. Plants from these hatcheries have not succeeded in maintaining viable populations of spring chinook and only marginal numbers of chum and summer steelhead. Hatcheries in the Puget Sound and Coastal areas of Washington have not generally succeeded in producing significant numbers of sockeye, spring chinook, pink, cutthroat or Dolly Varden.

This region's dependence on hatcheries has come under increasing scrutiny in recent years following comprehensive reviews by the Washington Department of Fisheries and U. S. Fish and Wildlife Service. Although many of the existing facilities were built with the goal of restoring or rebuilding wild stocks, these hatchery programs have not been successful in restoring naturally spawning populations, have had negative impacts on other stocks, appear to impact naturally derived genetic diversity, foster disease outbreaks, and may simply replace existing wild stocks with artificially produced fish, thus increasing the likelihood of petitions filed pursuant to the Endangered Species Act. Additionally, raising fish in hatcheries and net pens instead of restoring naturally spawning stocks would not result in the restoration of the ecosystem and would not be consistent with the Federal government's trust responsibility to Treaty Indian Tribes.

Question/Comment 22: There are rivers on the Olympic Peninsula that don't have dams and yet fish runs there have declined. What makes you think restoration will be successful on the Elwha?

Response 22: Habitat loss and degradation are the most significant problems in the loss of salmon and steelhead stocks. The most common watershed perturbation on the Olympic Peninsula has been extensive timber harvest, resulting in siltation and the loss of riparian vegetation and large woody debris. Other common habitat problems are flood control measures (i.e., bank hardening such as rip-rap, constrictions of floodplains), agricultural development, rural development, water withdrawals, hydroelectric projects (e.g., Cushman on the Skokomish River), and loss of wetlands and estuarine areas. Except for the two dams, the vast majority of the Elwha watershed has been protected and remains in essentially pristine condition by its inclusion in Olympic National Park. More of the Elwha drainage lies protected within the park than any other river on the Olympic Peninsula. Based on mainstem miles only (not including tributaries or total basin area), 75% of the Elwha is located within the park boundaries. In other rivers, such as the Queets and Hoh, large portions of the watershed are outside the park and are subjected to extensive timber harvest, especially on the lower reaches and their tributaries. Fish over-harvest is addressed in Responses 19 and 20 while the impact of hatcheries is addressed in Response 21.

Despite these threats to anadromous fish, many stocks of salmon and steelhead remain in excellent condition and are increasing in abundance. While some stocks of chinook salmon have declined, returns to most Olympic Peninsula rivers have been strong. Five-year-average returns to the Queets, Hoh and Quileute rivers have increased by two to three fold since 1975. Winter steelhead returns to coastal rivers have also been very strong, although the status of summer fish remains a concern. The largest total return of wild, winter steelhead to the Quileute River system (since 1977-78 when good data are available) occurred during the 1987-88 season. The number of spawning steelhead has exceeded the goal in the Quileute River in each of these years, as it has on most other North Coastal rivers.

Question/Comment 23: Is it possible to restore the big chinook salmon, up to 100 pounds, that historically swam the Elwha River?

Response 23: The short answer appears to be "yes," notwithstanding that the last exceptionally large fish from the Elwha River was a 70-pounder gaffed in 1946 by Ernie Brannon, the former Superintendent of the Dungeness Hatchery. In a 1983 conference on wild fish, Brannon's son, Dr. Ernest Brannon, Jr., and Dr. William Hershberger discussed the genetic features of the Elwha chinook as follows:

> The environmental circumstances in the Elwha River,

> including those during incubation and early rearing and, later, those in the Strait of Juan de Fuca and the more distant ocean paths have shaped that stock temporally and spatially to produce a large robust fall running fish. The relationship between the Elwha chinook and its river has shaped that stock into a phenotype with maximum fitness for an environment with a unique set of circumstances in time, space and resources.

Brannon and Hershberger further wrote:

> Why don't we see larger fish returning to the Elwha today? This is certainly a question often asked and the answer is probably that hatchery propagation has resulted in a smaller size. This situation is common with most hatchery produced fish, but it is incorrect to attribute this reduced size to the genetic or breeding programs of hatcheries. The change is a product of hatchery rearing practices. Rapid growth will result in an earlier age of return, and since hatcheries usually grow their fish more rapidly than fish can grow in natural environments they mature and return at a younger age and are therefore smaller. The genetic potential for large size is still retained by the Elwha fish. However, since the characteristics of the fish are the expression of both genetic and environmental influences, the genetic attributes can't manifest themselves in the same manner in a different environmental background. Hatchery production dramatically changes the environmental component and the present characteristics of the Elwha chinook salmon are the expression of the new combination. The potential to reproduce the historical characteristics is still present.

Allowing Elwha salmon to return to their ancestral environment, as it is preserved in Olympic National Park, should eventually result in the return of the river's fabled large chinook.

Question/Comment 24: Why won't passage facilities such as a fish ladder work to restore those threatened stocks?

Response 24: A fish ladder addresses only half the problem (e.g., upstream passage), the other being the safe passage downstream of juveniles and post-spawning adults. The potential success of a fish ladder at Glines Canyon Dam is questionable given the height of the structure (210 feet). Some fish species, notably pink and chum salmon, Dolly Varden/bull trout and cutthroat trout, could have difficulty ascending such a high ladder. One option at Glines Canyon Dam would be to trap the fish and physically transport them (by truck) around the dam. However, trap-and-haul facilities can result in significant migration delays, since fish must wait to be transported, and handling mortalities. The combination of a fish ladder at Elwha Dam and a trap-and-haul facility at Glines Canyon Dam would result in an estimated mortality rate of 14% to 19% for adult fish passing both projects, although spring chinook salmon losses could be much higher.

In terms of passing juvenile fish downstream, it has been found on the Elwha and elsewhere that significant numbers of juvenile fish die in the reservoirs, over the spillways, and through the turbines of hydroelectric dams. Even with juvenile fish screens and facilities to bypass fish around dams, many fish die as a result of predation at the point of return to the river when the fish are disoriented and concentrated in numbers.

Screening and bypass may be possible at Elwha Dam, but high cumulative mortality would be expected in the reservoir, spillway and fish screens. Even with state-of-the-art ladders and fish screens, some species of salmon, such as pink and chum, cannot migrate through reservoirs and could not be restored if the dams remain in place. Consequently, cumulative losses reduce the prospects for restoring some species while virtually eliminating the chance of restoring others.

Question/Comment 25: Why can't you build a new river channel around the dams to allow the fish to migrate downstream naturally?

Response 25: There are several problems associated with such an endeavor, including:

1. Salmon and steelhead juveniles migrate downstream at all sizes and times of the year. A screening facility would have to be designed and constructed in the Elwha River above Lake Mills that could direct the fish year round into the new channel. Such a screening facility would require the construction of a large structure in the river channel, essentially a new dam. The structure would create an additional hindrance to adult salmon upstream migration, even with the provision of a fish ladder, and would be inconsistent with Olympic National Park and Wilderness designation. Support facilities and access would also be required.

2. It would be expensive. In addition to the cost of constructing a new channel around each dam, existing fish passage technology calls for water velocities across the face of screens to not exceed 0.4 feet per second to protect the small sized fish. This means that 2.5 square feet of screen is required for each cfs of river flow. Mean average daily flows during the months of March to June is about 1,700 cfs (Table 5), which would require over 4,200 square

feet of screen. A flow of 10,000 cfs would require 25,000 square feet of screen. Even this amount of flow is often exceeded. The annual costs of operating and maintaining the screen facility and channel, including the removal of woody debris and leaves from the screen during high flow events, would be costly as well.

The maximum screen area currently in use in the Pacific Northwest is about 3,000 square feet. Design and construction of a screen facility much greater than about 3,000 square feet would require the extrapolation of existing screen technology beyond that used elsewhere. Unforeseen problems and costs could result.

3. Construction of a channel around the dams to provide the capacity and slope necessary would have to meet certain gradient guidelines to provide suffient head for the passage of water and fish down the channel while preventing the flow from becoming pressurized. A suitable site sufficiently upstream of Lake Mills would be necessary to allow for a channel that did not decline below the water surface elevations of both Lake Mills and Lake Aldwell, substantially increasing cost.

4. It would be impractical to screen the entire river flow during peak flow periods, the times when large numbers of fish migrate. Therefore, fish would be passed over the screen facility during flows exceeding the design capacity. Also, fish produced in the river between the dams would not have access to the new channel. Losses of fish would continue to occur in the reservoirs and during passage past the dams.

5. Juvenile fish moving downstream are not always migrating to the ocean, but rather they are seeking new rearing areas. Diversion into an artificial channel would limit their ability to secure new rearing areas. It would also concentrate fish in a relatively small amount of flow, thereby increasing predation and disease risks.

6. The point of return of fish to the river can be the greatest cause of mortalities associated with passage facilities because the fish are disoriented and concentrated, thereby attracting large numbers of predators. The channel concept would not alleviate this problem.

7. The problems associated with stream bed armoring, nutrient settling in the reservoirs, inundated riverine habitat, and elevated water temperatures would continue.

8. The amount of water diverted into the new channel would reduce power production accordingly, further eliminating any

cost advantage for the mill resulting from producing rather than purchasing power.

Question/Comment 26: The Report describes a 6% loss of juvenile chinook going through the turbines. This is a 94% survival rate which is actually quite good. Why is a 6% loss to turbines fatal, when a 99.9%+ loss in the ocean is not?

Response 26: The Report cites fish passage studies conducted on the Elwha River at Glines Canyon Dam. These studies indicated a 60% loss of the juvenile chinook that passed through the turbines at the Glines powerhouse, not 6% (see Section V.D.4.a. Chinook Salmon). Losses at Elwha Dam are not included in this estimate but are additive. Although not all the outmigrant chinook will exit through the turbines, these losses combined with reservoir delay and mortality, upstream losses of adults, exacerbated diseases in the lower river due elevated water temperatures, and inundation and degradation of the spawning substrate in the middle and lower river combine to greatly reduce restoration prospects.

Question/Comment 27: Pink salmon ascend into impoundments in Canada, surely they could at least get up to the area between the lakes.

Response 27: No pink or chum salmon populations in the State of Washington are found above reservoirs. Pink and chum salmon fry emerge from spawning gravel at a very small size and begin moving downstream to the ocean almost immediately. They're so small that they have little swimming ability; instead, they are swept along by streamflow. Surviving on nutrients remaining in their yolk sac, they must arrive in estuarine and marine areas at a time when food (marine plankton) of proper size is present in abundance. Studies have shown that it is extremely difficult for these youngsters to survive in a reservoir. Disoriented, ineffectual in swimming, and lacking nutrients, great numbers of them perish or fall prey to predators.

Agency biologists contacted fisheries managers in Canada and Alaska and did not find any instances where naturally reproducing populations of pink or chum salmon are found above impoundments, although there are a few isolated instances where chum occur above natural lakes. In most cases, these chum are found above lakes in years of unusually large returns and when there is high competition for available spawning areas. However, it does not appear that these individuals are self-perpetuating.

Question/Comment 28: Getting pink salmon beyond Lake Mills seems unimportant since they will almost certainly be stopped within a mile or two by natural barriers. Is it also proposed that the river be reworked to remove those natural barriers?

Response 28: Agency estimates of pink and chum salmon distribution and production potential in the Elwha drainage are based on the assumption that these fish would only ascend as far as Rica Canyon above Lake Mills. This assumption was made because of the increasing gradient and not barriers to migration. A radio-tagging study conducted in 1983 indicated that summer steelhead ascended through Rica Canyon without any apparent delay.

Question/Comment 29: The power supply section does not accurately convey the level of controversy associated with the development of new generating resources.

Response 29: The estimates of resource availability (Section VI.M.1) are of "developable potential", representing the amount of resources actually expected to be developable. Developable potential is estimated by adjusting economic potential by anticipated constraints to development. For example, the estimated availability of 350 average megawatts of geothermal power is half of the estimated economically-available resource because of anticipated land use and environmental conflicts. Also, the estimates are of developable potential over the 20 year period of the Northwest Power Planning Council's 1991 power plan and are not necessarily fully available at present. Specifically, much conservation potential becomes available only with continued economic growth and resulting new end uses.

Question/Comment 30: Dam removal would replace hydro-generated power with fossil fuel generated power when we are concerned about global warming.

Response 30: As described in Section VI.M, it is likely that a portion of the power currently supplied by the dams would be replaced by power generated using natural gas. Such plants would produce carbon dioxide, a suspected contributor to possible glomal warming. Though the probability and extent of global warming from the production of man-made greenhouse gasses is not presently known, the possible consequences of global warming are sufficiently serious to cause the administration to propose actions to limit, and eventually reduce, the rate of carbon dioxide releases to 1990 levels. Though economic incentives to prompt such actions (e.g., carbon or energy taxes) have been proposed, actions to achieve the targeted reductions are as yet voluntary.

The general approach being used by the Northwest electric power industry to deal with the possible need to control carbon dioxide releases is to secure all cost-effective conservation and renewable resources, to provide a cost credit (usually 10%) when comparing conservation with other resources, and to invest in projects to improve the long-term capability to secure additional conservation and renewable resources. In addition, several of the region's public utility commissions have required utilities to provide additional cost credits when assessing the cost-effectiveness of conservation and renewable resources. Finally, several Northwest utilities and resource developers including PacifiCorp and the Bonneville Power Administration (BPA, through the developer of the Tenaska Washington II power plant) are conducting demonstration programs for biological sequestering of carbon.

Question/Comment 31: Because conservation will be the replacement resource of choice, air quality impacts will be less than stated in Section VI.M.

Response 31: The analysis of replacement power costs selects new resources, including available conservation, in order of cost-effectiveness. Therefore, the air quality impacts are expected to be as stated if power from the dams is replaced by general resource development. Because of the location of the Daishowa Mill near the western extremity of BPA's Puget Sound Area transmission grid, there may be economic justification in developing more expensive local resources to offset the transmission costs associated with resources developed elsewhere on BPA's system. Because of the increased cost-effectiveness level that may be justified for local resource development, there may be more cost-effective conservation than indicated by the regional assessment of resource availability used in this report. If so, the air quality impacts may be less than estimated.

Question/Comment 32: Will there be a greater reliance on nuclear energy if the dams are removed?

Response 32: It is highly unlikely that there will be greater reliance on nuclear energy if the dams are removed. The only nuclear power plants that could be brought into service in the near-term are partially completed WNP-1 and WNP-3. These units have been preserved as insurance against high load growth, rapid increases in fossil fuel prices or other conditions requiring the development of large new resources. Because of the continuing availability of competitively priced natural gas, moderate load growth rates, the economic risk associated with these large plants, and the recent retirement of the Trojan nuclear plant, it is increasingly unlikely that WNP-1 or WNP-3 would be considered when seeking new power supplies. The Bonneville Power Administration (BPA) has recommended termination of these plants to the board of the Washington Public Power Supply System. Because BPA has been funding much of the cost of preservation, it is likely that the recommendation will be followed. No other nuclear plants are available for completion, and it is highly unlikely that new nuclear plants will be considered until nuclear waste disposal issues are resolved and smaller, less expensive and more reliable nuclear designs are available. These issues will not be resolved for many years.

Questions/Comment 33: The loss of power produced by the dams would cost $848 million over 50 years.

Response 33: It is not clear how the $848 million figure was calculated. The value of the lost power from removal of the Projects can be considered equal to the cost of replacement power (see Section VI.M). However, the Federal Energy Regulatory Commission (FERC) used a 50 year time period when calculating the value of "foregone generation" as $110 million (see page 5-30, Draft Staff Report, Volume 1, March 1993). FERC calculated the $110 million figure based on conservative assumptions of the fish and wildlife mitigation measures that would be required if the Projects are licensed. The fish and wildlife agencies maintain that significantly more mitigation (e.g., juvenile fish screens at Glines Canyon Dam, gravel supplementation in the lower river) would be required, thereby reducing the "foregone generation" value by the cost of the additional mitigation.

October 14, 1993

RECEIVED
MAILROOM
93 OCT 19 AM 11:12
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Hon. Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt:

The enclosed letters are from children in my kindergarten class at Clark Elementary in the Issaquah School District. We have been learning about salmon and their life cycles. One of the children brought in a brochure which talked about the possible razing of the dam on the Elwah river. The children were very interested in his description of the problem which he stated as being between having "cheap electricity" and saving the lives of salmon. We discussed the problem--the children's responses ranged from wanting the dam kept to wanting it eliminated to wanting someone to build fish ladders or to put a "hole" in the dam for the fish to come through.

Some children chose to write letters to you telling you that they think the dam should be taken down to save the salmon. The others who felt differently were not interested in writing letters. In some cases the children wrote by telling me their ideas and I wrote them down. In one case, a child wrote you her very own special letter. The children all wrote their names and in some cases their ages.

If you are able to respond to them, I know it would be very exciting to them to receive a response.

Sincerely,

Deborrah Corr

Deborrah Corr
Kindergarten Teacher
Clark Elementary
500 2nd Ave. S.E.
Issaquah, WA 98027-4315

build a fish Ladder

[illegible]

Oct. 14, 1993

RECEIVED
93 OCT 19
PARK

Dear Mr. Babbitt,

I think we should take down the Elwah damn. I think they should take it down where the fish are dying.

The fish should go to the food bank.

I like salmon, and I wish to have them not die there. I love them.

RAE LINDZE

Oct. 14, 1993

Dear Mr. Bobbitt,

I think the Elwah damn should be taken down. I want the salmon to be able to come through.

We need to get our electricity different ways.

JACK 5½ years old

AARON 5½ years old

AARONL
6

ECO-WATCH/SONOMA,

The Honorable Bruce Babbit
Dept. of the Interior
1849 C Street NW
Washington, DC 20240

November 2, 1993

Dear Secretary Babbit:

Thank you for the strong report on the restoration of the Elwha River Ecosystem. We agree with you that we must remove the dams blocking the Elwha river and others. Removing some of the dams blocking our anadromous fish runs does in fact present "an enormous opportunity" for ecosystem restoration. We urge you to continue facing this countries environmental problems in the same bold and brave manner that you have addressed past issues. We support your efforts fully.

Sincerely,

Martha D. Masura

Lorraine Mac Kenzie

11/12/93

October 24, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, Wa 98362

RE: The Elwha River Restoration Act

I welcome your interest in considering all ways possible to restore the Elwha River, resulting in eventual restoration of our salmon.

The Elwha restoration plan should be implemented as soon as possible, with the necessary funds appropriated for this action.

We in Washington State have been disturbed for some time about the lack of specific attention to the restoration of the salmon runs, so necessary in our State.

Your approval and action on this matter will be appreciated.

Laura A. Hardero

Laura A. Hardero
4505 152nd Lane SE, Bellevue, WA 98006

cc: Senators Murray, Gorton
Rep. Foley, Dunn
The Office of the Vice President

[illegible]

RECEIVED
MAILROOM

93 NOV -1 PM 2:53

OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Dr. Brian D. Winter
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Ave
Port Angeles WA. 98362

10/27/93

Sir:

I am responsible for (legally own) 23 acres bordering Indian creek in Indian Valley. I have been a resident of Indian Valley for the past nine and one half years. During this time I have observed both Indian Creek and the Elwha River. I have fished the river extensively from Lake Aldwell to Lake Mills. Old time and former residents of this area have told stories of how people used to come to the area of Indian Creek which I can see from my house and harvest salmon, placing them in barrels for salting and smoking.

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I have considered the question of the dams on the river a number of times and have always had the feeling that they should be removed. Since there had appeared significant popular feeling which agreed with mine I had not thought the problem much further. I was asked for my opinion on the subject recently and and have changed my perception of the problem after trying to defend an indefensible position.

The crime was committed when the dams were built. We may punish the guilty but we cannot restore the situation to where it was prior to the dams. An ecosystem exists on the river and it's tributaries. If the dams are removed, this ecosystem will be destroyed and a new one evolve. True, the new one may allow for proper salmon breeding and then it might not in the near future. But let's face it, it won't be the way it was prior to the dams being built.

The only valid objection I have heard relative to the dams relates to salmon and their absence above Lake Aldwell dam. On the other hand, I have personally observed the advantages of the dams relative to flood and erosion control and wonder if the dams were not there if we would not have a group advocating the installation of reservoirs for flood control. The water in Indian Creek normally runs about twelve inches deep under the bridge to my property. During severe periods of rain which I have personally observed at least three times, the water level raises to three feet. I can just imagine what the river would do without the two reservoirs as buffers. I have noticed how the erosion of the Elwha river banks has progressively redefined the river channel in a number of my favorite fishing areas even with the Lake Mills buffer. I wonder about the houses which have been built on the river bank and how they will be threatened by the river without Lake Mills as a buffer.

It seems to me that if we are contemplating more than two hundred million dollars for "restoration" of the Elwha River ecosystem that a lesser amount of money could well solve the only real problem that exists i.e. providing for proper salmon passage through the dams. I don't feel that the generation of power by the dams has even close, much less equal, priority with protecting the fish. After all if we are willing to remove the dams, we should be willing to shut the turbines down. Let's face it, we can not "restore" the Elwha ecosystem no matter how many dollars we throw at it, we can only change it. What it is changed to by removing the dams may not be as pleasing to us as the existing ecosystem and may cause problems even more serious than the present ones.

I suggest two things be done (the second I agree is not within your charter). (1) Develop a survey of the people who live in the Elwha drainage area (these are the people who will be affected on a day to day basis by the decision) to gather their feelings and impressions directly. Don't cop out by saying we have solicited input - most people out here work and have little time to fight windmills, but will probably respond to a direct request for input. What they say may suprise you. (2) Get the issue on the next Clallam County ballot (Shall the Clallam County Commissioners resist State and Federal attempts to remove the Glines canyon dams) so that advocates of the two positions have the opportunity to get the real issues out and you can get the consensus of opinion from those who really count in this issue.

Wayne E Mabrey
237716 Hwy 101 W
Port Angeles WA. 98362
(206) 452-7507

[illegible] - 1 [illegible]

235

October 9, 1993

Dear Secretary Babbitt,

Supporting your position in removing dams on the Elwha River, I urge you to pursue implementing legislation to fund dam removal & river restoration.

Thank you for your continuing efforts on behalf of the environment.

Respectfully yours,
Adrian Raines

10/12/93

October 10, 1993

The Honorable Bruce Babbit
c/o Olympic National Park
600 East Park Ave
Port Angeles, WA 98362

Dear Mr. Babbit,

Thank you for your strong report on the Restoration of the Elwha River Ecosystem. We agree with you that we must restore the Elwha River by removing the blocking dams.

Please move swiftly to implement the Elwha River Restoration plan by budgeting funds, developing a definitive action plan, and establishing a time table for removal of the Elwha and Glines Canyon dams.

This is a great opportunity to restore an invaluable ecosystem.

Yours truly,
Jack V. Sweeney
Ruth L. Sweeney
10223 40th SW
Seattle, WA 98146

10/12/93

8 October 1993

The Honorable Bruce Babbitt
Secretary of the Interior
C/O Olympic National Park
600 E. Park Ave.
Port Angeles, Wa. 98362

Secretary Babbitt,

I am writing to you to thank you for your recognition of the need to restore the Elwha River. In addition I want to express my support of the removal of the Elwha and Glines Canyon hydroelectric projects on the Elwha River in western Washington.

As a trained fisheries biologist I am confronted on a daily basis with the desperate condition of the fish populations along the Strait of Juan de Fuca. The potential impacts of species or stock extinction in significant biologically, economically, and socially. We must halt this slow drift towards the misuse of public resources for the short term benefit of the few. Our Nation's resources must be managed for all citizens, not just of our generation, but for generations to come.

The restoration of the Elwha River ecosystem hold a perfect example of how this can be accomplished. Unlike many fisheries/ecosystem/habitat restoration projects the Elwha system has a strong possibility to succeed in a relatively short period of time. The habitat quality of the river from river mile 16 and beyond is excellent.

The present status of the salmon runs on the river is critical. Swift implementation of the Ecosystem Restoration Act must occur if full restoration of the river is to become a reality.

Sincerely,
Lawrence Ward
Lawrence Ward
250 E Simmons Road
Port Angeles, Washington 98362

10/12/93

18102 45th Ave. S.
Seattle, WA 98188

Oct. 11, 1993

Dear Sec. Babbitt

I would like to add my voice to the growing list of individuals and organizations that support removal of the dams on the Elwha River in the State of Washington. Please see the enclosed [illegible], and you will realize there is considerable interest in removal of the dams.

Most administrations have taken pride in building dams, roads, bridges, airports, etc. While often necessary, these aspects of modern civilization also carry a high price in terms of environmental degradation, [illegible] impact, overuse of resources and pressure on animal and plant species. The Clinton-Gore administration has a unique opportunity to correct the errors of the past and set an example for future generations. True cost/benefit analysis must look at all costs, not just those that are easy to measure. Through such analyses, it seems clear to me that the dams must go.

I urge your strong support and budgetary commitment to the removal of the Elwha and Glines Canyon dams. Hopefully, the day is not that far off when the salmon runs will begin again.

Thank you

Sincerely
Lawrence Weinberg
Lawrence Weinberg

10/12/93

October 7, 1993

To whom it may concern,

Regarding the demolition of the dams on the Elwha River a big congratulations to those involved.

The fish will run free once again! Hopefully, we can look to restoring more of our beautiful rivers.

"Leave it as it is we cannot improve on it, the ages have been at work, and man can only mar it." Teddy Roosevelt

Sincerely,

Jeffrey C. Rexroat

(206) 483-4135

Jeff Rexroat
5722 220th ST SW #2
MLT., WA 98043

EVERETT, WA 98203 10-07-93

Brain D. Winter
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362-6757

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PAGE

Seattle Times, 10/10/93

Bring back the Elwha, correct an old mistake

STEP by step, the federal government is moving closer to restoration of a great river decimated by two dams that should never have been.

The dams — built in 1911 and 1926 without fish ladders — gutted fabled salmon runs and damaged the ecosystem of the Olympic Peninsula's Elwha River. A heavy environmental price was paid for a small amount of cheap power.

This state's delegation won congressional support for removal of the dams. Congress gave the Interior Department permission last year to buy and demolish the dams — if it determined such moves are needed to restore the ecosystem. The study is complete. In a draft report, the Interior Department concludes that can be done only by tearing down the two dams.

That won't be easy. It won't be quick. Removal would have to be staged to prevent sedimentation damage. The lowest cost estimate has been $65 million. Interior officials now say that dam removal and fish and habitat restoration would cost between [illegible] million and [illegible] million.

When Congress conditionally authorized removal of the dams, it made no appropriation. The money will be tough to find. The complete project could take 15 to 20 years.

The Elwha was the rare home of all five species of Washington salmon, including giant king salmon that exceeded 100 pounds. Biologists say runs can be restored.

There need not be negative impact on a Port Angeles pulp mill. Congress has ordered the Bonneville Power Administration to make sure power is available if the dams are removed.

Dams have been removed in national parks for safety reasons, but not for resource renewal. That's what sets the Elwha apart. It would show the nation that 82-year-old environmental mistakes can be corrected.

[illegible]

[illegible]

November 8, 1993

Brian Winter
Olympic National Park Hq
600 E Park Ave
Port Angeles WA 98362

RE: ELWHA REPORT

Enclosed is a list of errors, omissions and questionable findings I have gleaned from reading the Elwha Report.

Sincerely,

J Marv Chastain

J. Marvin Chastain
356 Lawrence Road
Port Angeles, WA 98362
928-3134

ERRORS AND OMISSIONS IN "THE ELWHA REPORT"

CHINOOK SALMON

The report states that the Chinook salmon run has poor chance of being restored with the dams in place.

Chinook salmon travel as much as six hundred miles up the Columbia River System into Idaho over a half-dozen dams much larger than the Elwha dams. I have video tapes made from home movies of the family of Ernie Brannon, state fisheries biologist, made in the 1960s (fifty years after the dam was put in place) showing him wading out into the lower river and gaffing huge chinook salmon, while the river teemed with fish. If the dams killed the Chinook run, why did it take sixty years for it to happen?

The study describes a 6% loss of juvenile chinook going through the turbines. (only 10% go down deep enough to get into the turbines - 60% of 10%) This is a 94% survival rate which is actually quite good. Some loss of smolt is inevitable even with no dams in place. The report also states that only about 4000 fish are returning out of 4,400,000 smolt released at the river mouth from the hatcheries. Why is a 6% loss to turbines fatal, when a 99.9%+ loss in the ocean is not? The statement that chinook cannot survive without dam removal is ludicrous - where is the data? Given the precarious state of the Chinook run at present, isn't it much more likely that the silt dumped into the lower river by a dam removal project will actually extinguish the last of the giant Elwha Chinook?

PINK AND CHUM SALMON

Pink salmon ascend into impoundments in Canada, surely they could at least get up to the area between the lakes. Getting beyond Mills seems unimportant since they will almost certainly be stopped within a mile or two by natural barriers. Or, is it also proposed that the river be reworked to remove those natural barriers? What evidence is there as to how far they got in the past? For the kind of money and economic loss dam removal will entail, you could build an elevator to put them up without any effort on their part.

FULL RESTORATION - *Definition?*

The report repeatedly states that full restoration of the Elwha salmon runs is possible by removing the dams. However, it gives no supporting data for this assertion, and appears to contradict itself by stating that sockeye runs probably can't be restored anyway. The law doesn't even define "full restoration", but for purposes of the study, it appears to be an attempt to recreate the Elwha valley as it was before white men set eyes on it. ??? How can this be accomplished without addressing the over-fishing in the ocean which certainly does not reflect pre-settlement conditions?

DEMONSTRATION PROJECT

There are a number of rivers which arise in the ONP and flow mostly through pristine environment to the ocean, which have no dams. All of these rivers have salmon runs that are in trouble. If the government has a magic formula to restore runs in damless rivers, why not do a demonstration in one or more of those rivers to show that it can be done?

POWER

Using Bonneville's figures on their projected wholesale billing rates, I calculate the loss to the economy of $848,000,000 for Elwha power that will not be generated over the next fifty years. (since Bonneville has lost a billion dollars in the last two years, this rate estimate is probably very low) This cost not reflected in the report. This at a time when all experts in the power field (confirmed in this report) indicate that we are heading into a time of acute power shortage. The government subsidizing power to Daishowa does not in any way make up for this loss. It is only another burden on future taxpayers. Furthermore, some power authorities say installation of high-tech generators and proper management could substantially increase power production.

The report does recognize that lost power would have to be made up by burning fossil fuels and estimates 47,300 tons of carbon dioxide will be emitted into the air annually by natural gas turbines making up this lost power (See attached work sheet). This seems in direct contrast with the president's recent speech on asking industry to help curb emmissions of so-called "greenhouse gasses".

OVER FISHING

The report admits that currently less than one tenth of one percent of young salmon released by the hatcheries at the mouth of the river ever make it back. These salmon are in no way affected by the dams. If we don't have an over fishing problem, then what is killing them?

Why do we see no proposal to mitigate the over fishing in the ocean, either that by man or by the protected marine mammals? How can you "fully restore" without even attacking the number one problem? Even with the greatest spawning facility in the world, fish which do not make it back from the ocean cannot spawn.

Obviously, no restoration of salmon can be anything more than temporary without such mitigation. An increase in salmon output will only sustain the current exponential rise in marine mammal populations and postpone the day when the salmon runs are exhausted and starvation sets in among these mammals.

WATERFOWL

The statement is made that ducks and mergansers would gain habitat by removal of the dams. These birds are found primarily on lakes and ponds. There is no explanation of how waterfowl gain habitat by losing habitat.

BEAVER

Beaver build their lodges in quiet water. There are beaver in the upper end of Aldwell. When the lake is drained, the entrances to their lodges will be exposed and the colonies will be wiped out by coyotes, cougars, etc. How can they possibly benefit from this?

SPOTTED OWLS

The statement is made on page 41 that "Removal of both dams would have no adverse impact of federally listed or proposed species". This requires explanation. This project will involve use of heavy equipment, blasting and probably some logging in spotted owl habitat, over a long period of time. It would appear that this whole project will be a gross violation of the government's own rules which forbid any disruptive activity in owl environment.???

TRUMPETER SWANS

This project will destroy the winter habitat for trumpeters on Lake Aldwell. Are not these rare and majestic birds at least as important as spotted owls? The study provides no anwer to this problem.

WATER TEMPERATURE

The report repeatedly cites the 2 to 4 degree summer warming of the river water as the cause of an often fatal parasite infestation in chinook salmon. Yet, they have no scientific proof for this statement. Water temperatures in the Columbia river system often are much higher than Elwha river temperatures. Based on this statement, chinook should not survive in the Columbia at all. Also, why did this only become a problem in recent years? The Elwha chinook run was very healthy for some 60 years (about 12 to 15 salmon generations) after the dams were put in place. A fish and wildlife representative explains that it is due to the massing of fish in the lower river, but failed to explain why the much greater massing of fish thirty years ago did not cause such a problem.

SOURCES

The Act gives authority (and implied obligation) for the Interior Secretary to use any other government agencies for this study. Why is it that we see no imput from the US Army Corps of Engineers who have no doubt built more fish passages around dams than anyone else in the world. Isn't this a case of "My mind is made up, don't confuse me with the facts?" No engineering studies were done. Brian Winter admits he is not an authority on fish passages and could not identify any fish passage authority in his team. Clearly, the fish passage issue was decided before the study even started.

AQUIFERS

At a depth of some 145 feet, the water pressure at the bottom of Mills should be around 65 pounds per square inch (9300 pounds per square foot). Given the jumbled geology of the Olympic Peninsula, there has to be considerable injection of water into underground aquifers. The report gives no data on where these aquifers go and who's well will be affected. Bureau of Reclamation representative agrees this may be so, but no studies were done to find out, and it is unlikely such studies could very accurately predict results anyway. We just have to "take our chances". Will the government compensate people who's wells go dry because of this boondoggle?

FISH CARCASES

On page 53, the statement," . . steelhead . . . do not die on the spawning grounds after spawning and their contribution to wildlife prey and nutrient cycling is not as great". How is it that one fish's carcass is more ecologically important than another? They all die.

FLUVIAL PROCESSES

On page 52, the statement, "current armored nature of the river". Reading this passage, one would think that a piece of gravel starts at the top of the mountain and rolls all the way down to the strait, except that it is intercepted by the lakes. Simple observation of the river says that it is constantly eating away at gravel banks, moving and depositing debris and in some cases actually changing course, and that the river between the dams contains lots of small gravel. Furthermore, one third of the water reaching Aldwell comes from tributaries which enter below Mills and which do not have dams. This statement is misleading. Actually, this "armored nature" accounts for only a hundred yards or so immediately below each dam.

This project is a blue print for environmental destruction which includes permanent loss of two lakes and their vast assortment of wildlife - some very rare. It provides for substantial damage to the river itself from which it may not totally recover (bureau of reclamation representative has stated that water quality after dam removal will never get back to what it is now). The benefits to salmon are highly questionable and negative impact on trout is certain. (Destruction of over 700 acres of trout habitat)

The project is a blue print for economic damage with power loss alone over the next 50 years amounting to at least $848,000,000, and costs of the project being nebulous, but most likely in the one quarter to one half billion dollar range.

No real effort has been made to inform the public. The study has been mostly kept within the confines of government agencies and environmental cults. A public hearing should have been held. Time should have been allowed for groups to get reports from their own experts on important controversial items in the report. Clearly, the intent is to slip this by the public and into the budget without any embarrassing questions being publicly asked.

October 7, 1993.

Mr. Brian D. Winter, Team Leader.
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362-6757

Re: COMMENT ABOUT REMOVING ELWHA DAMS.

Dear Sirs,

My comment regarding dam removal is that it is a good idea.

The reasons supporting my view include the following:

1. The two dams do block the life-sustaining flow or movement of fish;

2. The two dams block the flow of sand to keep Ediz Hook at Port Angeles;

3. The two dams are vulnerable to collapse by known seismic risks, including the Cascadia Zone Subduction Zone inter-face which is believed now to be locked and, when unlocked, is calculated to cause an earthquake of approximately size nine in magnitude on the Richter scale which would be enough to drain the two lakes and to cause hundreds of people to drown.

4. The rebar, or reinforcement steel within the dams is not epoxy coated. When it rusts it swells and explodes, cracks, the concrete encasing it, weakening the dam. If you stand on a knoll on the east side of the Elwha about 100 to 200 feet north of the upper dam you can look across at the spillways and can see where swelling structural steel has burst, cracked, the concrete near the place where the spillway "axle" enters the concrete.

5. The two dams are now illegal since neither has a presently valid license.

Very truly yours,

Calmar A. McCune
PO Box 845
Port Townsend, Washington 98368

10/12/93

I will be urging all my congress-people to support PL 102-495. If ever there was a project with overwhelming cost/benefit criteria and a true win/win objective this is it.

Truly "Bring Back the Elwha." (I would only wish for a shorter time line.)

(I'd like to see a free flowing Elwha while I'm still around.)

Very best wishes,

Gordon C. Sylliaasen

GORDON C. SYLLIAASEN
3700 139 AVENUE S.E.
BELLEVUE, WA [illegible]

Oct 24, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, Wa 98362

I really enjoy The Elwha river system and want to say it is important to me that we remove the dams blocking the Elwha River.

Thank you for your Efforts

Celeste Dodd

Celeste Dodd
7348 Mirimich Beach Dr
Olympia, Wa 98502

---

112 THOKEN
PT. LUDLOW, WA
98365

The Honorable Bruce Babbitt,

I am native of the Olympic Peninsula and have grown up with many of the environmental tragedies such as the construction of the Elwha River dams. I celebrate your willingness to take action on removing the dams to free the river is a monumental step for nature and a shining example that politicans can trek beyond the treasured dollar.

The return of our salmon, our oldest natives, would signify not only the restoration of the fishing industry but hope that it isn't too late to save the diverse habitats of countless other species, including ourselves.

Our Wild Olympic Salmon Festival will be celebrated on Nov. 27th at the Chimacum Park in Jefferson County. We heartily invite you to join us and pray for your continued support! Thank you. Jana Allen

OCT 28 REC'D

Dear Secretary Babbitt,

I have become recently aware of the urgent need to act on the congress' recent Elwah River Restoration Act. I fully support the terms of this act and the restoration of the native salmon runs of the Olympics.

Please make the Elwha a high priority in the interior department budget. Please include the funds needed for dam removal and river restoration in the upcoming Administration appropriation requests.

Sincerely,

Sean Caughlan

SEAN CAUGHLAN

(Student, The Evergreen State College)

4217 Indian Pipe Loop, R208
Olympia, WA 98505-0003

OCT 26 RECD

1410 Alameda Dr
Oly, WA 985
10-23-93

The Honorable Bruce Babbit,
c/o Olympia National Park
600 E. Park Ave
Port Angeles, WA 98362

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with removing the Dams blocking the Elwha River

Roberta Condon

OCT 28 RECD

Bellevue WA
12 Oct 1993

Dr Brian P Winter
Elwha Restoration Interagency Team

Dear Sir,

Thank you for sending the summary report on the Elwha restoration project. I am delighted beyond words with the outcome of this study.

The Secretary's Determination and the "Conclusion" with admirable eloquence say it all I think.

You and your organization are commended for seemingly to have brought all the parties together on this noble effort.

10/13/93

3602 East Schubert Place · Seattle, Washington 98122

October 11, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt,

I want to add my voice to those supporting removal of the dams blocking the Elwha River and urge you to push forward the Elwha Restoration Plan.

Yours sincerely,

Constance Q. Pious

10/13/93

4510 Kingsway
Anacortes WA 98221
October 10, 1993

Dear Mr. Babbitt

I'm writing to thank you for your strong support for the restoration of the Elwha River Ecosystem and to encourage you to insist upon removing the dams which block the river.

I have visited the Northwest often in the past when I lived in Wash. D.C. and since I moved here in 1988. What is happening to the natural resources and environment is startling, frightening and angering. If you will place the Elwha as a high priority in your budget and include adequate funds to remove & restore that area I will be most grateful. I will look forward to seeing that you have developed a timeline for accomplishing that work.

Again, thank you for hearing this cry for help.

Sincerely,

Susan F. Woolsey

Mr. Andrew H. Salter
8424 S.E. 61st Street
Mercer Island, Washington 98040

October 12, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
800 E. Park Avenue
Port Angeles, Wa· ·ington 98362

Dear Secr· Babbitt:

·ank you very much for your strong report on the restorat· · of the Elwha River ecosystem. I strongly support removal · the dams blocking the Elwha River. This presents a great opportunity for restoring an invaluable ecosystem. I urge you to move swiftly to implement the Elwha River restoration plan and to make the Elwha a high priority in the Interior Department budget. The budget should include funds needed for dam removal as well as river restoration.

Thank you very much for your consideration.

Very truly yours,

Andrew H. Salter

10/13/93

246

Oct. 9, 1993

To: The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, Wa. 98362

From: Norman C. Kunkel
3457 S.W. Trenton
Seattle, Wa. 98126

Re: Removal of Elwha dams

Thanks for your support on the restoration of the Elwha [illegible] ecosystem.

I urge you to:

1. Move swiftly to implement the Elwha River Restoration Plan.
2. Make this plan high priority in the Interior budget
3. Develop a definite action plan and funding for the removal of the Elwha and Glines Canyon dams.

The salmon can't wait. They have been on "hold" for 80 years!

Sincerely,

10/12/93 Norman C Kunkel

Michael J. Herschensohn, Ph.D.
1918 First Avenue North
Seattle WA 98109-2501
(206)283-2237

The Honorable Bruce Babbitt
℅ Olympic National Park
600 E. Park Avenue
Port Angeles WA 98362

Dear Secretary Babbitt

1. Move swiftly to restore the Elwha River
2. Place the restoration of the Elwha River as high as possible on the list of Department of the Interior budget priorities
3. Demolish as soon as possible the Elwha and Glines Canyon Dams

Acting quickly on all of these points will be a major political step forward for you and the Clinton Administration in the Northwest and throughout the United States. It is time demonstrate worldwide that when it comes to environmental issues and the protection of threatened species and environments there is indeed a new government in Washington.

Thank you for saving the anadromous salmon runs of the Elwha!

Sincerely,

Michael J. Herschensohn, Ph.D.

10/12/93

October 11, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA. 98362

ELWHA RIVER

We give our strong support to the removal of the Elwha and Glines Canyon dams. We do hope a definite action plan, time schedule, and financing can be established for a quick removal of these two dams.

Can you imagine bear fishing the Elwha for salmon? I do hope Congress acts quickly. We feel an urgency to get that beautiful Elwha back to its natural state.

Sincerely,

Duncan and Margaret McKiernan

Duncan and Margaret McKiernan
P. O. Box 2022
Port Angeles, Washington 98362

10/13/93

October 12, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.,
Port Angeles, WA 98362

Dear Secretary Babbitt:

I appreciate the position you have taken on the destruction of the dams on the Elwha River in the Olympic National Park. Please continue to put this plan on a high priority as the salmon won't wait much longer.

I urge you to develop a swift action plan for the removal of the Elwha and Glines Canyon dams.

Thank you for your intelligent leadership in the Dept. of Interior. It is indeed refreshing.

Sincerely,

Nancy M. Ashenfelter

Nancy M. Ashenfelter
3915 "W" Ave.,
Anacortes, WA 98221

10/13/93

SEA-TAC CHIROPRACTIC CENTER
[illegible] Pacific Hwy. S • Seattle, WA [illegible] • [illegible]

October 10, 1993

DAVID M. SCHEER, D.C.

The Honorable Bruce Babbitt
Olympic National Park
600 E. Park Ave.
Port Angeles, Wa. 98362

Dear Mr. Babbitt:

I really appreciate your strong support for the Restoration of the Elwha River Ecosystem---my family and I are truly in love with that Olympic part of Washington.

I would urge you to remove the Elwha and Glines Canyon dams just as quickly as possible in order to restore the natural ecosystem and bring back the salmon runs---I certainly hope this becomes a high priority in the Interior Department budget!

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As one who has always liked the outdoors, and especially hiking on the Olympic Peninsula, I hope that a plan can be formulated, and a timetable adhered to, for the elimination of these two dams.

I appreciate your hard work in this effort.

Sincerely,

D.M. Scheer, B.A., D.C.
David M. Scheer, B.A., D.C.

10/13/93

October 12, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Mr. Secretary:

I appreciate your stand in the report on the Restoration of the Elwha River Ecosystem. I too would like to see the dams blocking the Elwha River removed. I feel this will allow a greater chance to restore the invaluable natural land and water system to this region. The decimated of the fish runs as well as the natural habitat has shown the folly of those dams in the first place. I speak with some authority in that my father was a damn builder for the Corps of Engineers on the Snake and Columbia River, in fact the Chief of Designer for almost all those projects and he knew how hard it was to have fish survival with even the best of damn structures in the 1950's and 60's and how much damns alter the basic ecosystems. Please make the removal of these dams a high priority in the budgeting process and begin the process of a plan of action and time line for dam removal.

Thanks for your concern, attention and work toward preserving our natural heritage for all mankind.

Chris Lunn
POB 7515
Bonney Lake, WA 98390
206/863 6617

10/13/93

249

Dear Secretary Babbitt, 10/8/93

I am so glad to have you as Interior Secretary. Thank you for your support for removing the dams on the Elwha river & restoring the ecosystem and fish runs there. I urge you to move forward quickly with this project - both in getting the money needed to do it & to get started right away. So much time gets eaten up with endless reports & committees & we need to get the fish back ASAP.

Thank you very much for your efforts -

Sincerely, 10/13/93

Karen Vanderbilt

RICHARD A. HARVEY MD, FACEP
8302 90TH STREET COURT NW
GIG HARBOR, WA 98332

The Honorable Bruce Babbitt 10/13/93
c/o Olympic National Park
600 E Park Ave
Port Angeles
WA 98362

Dear Mr Babbitt:

I completely support your plan to remove the Elwha dams. Only with the dams gone can we restore the incredible salmon runs which ended when the dam was built. It's rare to have an opportunity to make such an improvement to an ecosystem. Thank You.

Yours Truly

Richard A. Harvey

RECEIVED
10/14/93

12 October, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt:

Your efforts to restore the Elwha River to a natural state are greatly appreciated by me. I dream to see the dams removed and the free-flowing river restored. Please make the monies for the restoration available immediately. I would like to see a budget, a plan and a schedule established for the removal of the Elwha and Glines Canyon dams as soon as is possile. Again, thank you for your exceptional work.

Sincerely Yours,

Randy Ternes

Randy Ternes
2125 4th Avenue West
Seattle, WA 98119

10/14/93

11337A 17th Avenue NE
Seattle, WA 98125
10/13/93

Bruce Babbitt
Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

We are writing you today to thank you for the strong report on the restoration of the Elwha River ecosystem. We agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

We ask that you move swiftly to implement the Elwha River Restoration Plan. To please include the funds needed for dam removal and river restoration in upcoming appropriation requests. Make the Elwha a high priority in the Interior Department budget. Finally we ask you to develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams. Thank you.

Sincerely,

Colleen Wright
David Glickerman

10/14/93

251

Dear Mr. Babbitt -

Thank you for the report on the Restoration of the Elwha River Ecosystem. I also believe that the dams on the Elwha River must be removed. This is a great opportunity to restore a valuable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan. Please make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming appropriation requests.

Please develop an action plan and a timeline for the removal of the Elwha and Glines Canyon dams.

Sincerely,

Paolo Pecora

PAOLO PECORA
5039 43 AVE S
SEATTLE WA 98108
(206) 760-8068

The Hon. Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA

Dear Secretary Babbitt

I am a resident of Seattle, Washington, and a lover of the Olympic Peninsula and its wild lands. Thank you for the forceful report on the Elwha River Restoration. I urge you to proceed with removal of the dams blocking the Elwha River!

Please make the Elwha Restoration program a priority in the interior Department budget. It would be a great triumph of Ecosystem management to see the return of all 5 species of Pacific salmon to this river.

Very Truly Yours

Mark R. Johnson

Mark R. Johnson
4032 W. Dravus
Seattle, WA 98199

10/14/93

10/14/93

4322 7th Ave NE #206
Seattle, WA 98105
October 10, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Sir:

I am writing to voice my support for the report on the removal of the two hydroelectric dams on the Elwha River and the restoration of the Elwha River Ecosystem. I would hope that we can now move swiftly to implement the Elwha River Restoration Plan. I would hope and urge that the Elwha is made a high priority in the Department of the Interior Budget and a definite timeline and action plan for the removal of both the Glines Canyon and Elwha dams is laid forth as soon as possible. Thanks in advance for your attention and action on this important issue.

Sincerely,

Christopher W. Schadt

Christopher W. Schadt

10/14/93

R. A. SHERRY
16425 104th N. E.
BOTHELL, WA 98011

To

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park

Dear Mr Babbitt

I implore you to implement the removal of the (illegal) dams — the Elwha and Glines Canyon. Please include the necessary funds needed for their removal & river restoration.
Thanks

Yours sincerely
Robert A. Sherry
MD

10/14/93

9052 17th Ave. NW
Seattle, WA 98116
October 13, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Secretary Babbitt:

We support the restoration of the Elwha River and its fish runs by removal of the dams on the Elwha. We appreciate your support of this measure and urge you to push for funding and development of plans for its completion. Thank you.

Yours sincerely,

Mr. and Mrs. Robert H. Ferber

10/14/93

---

(206) 388 3487

the Adopt-A-Stream Foundation
box 5558 everett • washington 98206

The Honorable Bruce Babbitt
Secretary of the Interior
C/O Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

October 12 1993

Dear Secretary Babbitt,

I appreciate your recommendation to restore the Elwha River salmon runs by removing the infamous Elwha Dam. I have been conducting workshops throughout the Northwest training schools and community groups to become stewards of streams and their surrounding watersheds. The negative impacts of dams like the Elwha and Glines Canyon which were installed without any regard to the surrounding ecosystems have not gone unnoticed by general citizenry.

Often we have been asked "why should we restore this stream, when the government keeps destroying it?" Recently I have been responding to that question by saying that we have a new Secretary of the Interior who appears to be actually concerned about the environment. And he seems to be moving to address some of the past problems on our Northwest rivers and streams.

I know that you are faced with making difficult decisions on a wide range of issues besides the Elwha Dam. I also know that those decisions become easier when you have support. I want you to know that I support your recommendation to remove the dam on the Elwha River, and urge you to develop a schedule and budget for implementation of that recommendation.

Please feel free to contact me if you would like any support when you present your recommendation to Congress for budget appropriations.

Sincerely Yours,

Thomas B. Murdoch
Executive Director

10/14/93

254

Silverdale, Wash.
10-13-93

To the Honorable Bruce Babbitt
% Olympic National Park.

Dear Sir:

I do agree that the Elwha River dams should be removed, the quicker, the better.

Besides the spawning runs of salmon, trout and steelhead in the rivers open also.

When the dams were put in, the Port Angeles sand spit started to erode. The river pushed out enough gravel and sand to keep the sand spit from eroding on the open side naturally.

As of now, the Corps of Engineers have to constantly install huge amounts of big rocks to keep the banks from eroding. In the rough weather, there is a natural pull of the water, as the waves work back into the sea, to keep flushing the material away from these rocks.

If the dams were removed, there would again be a natural buildup on the shores of the sand spit, to keep it in repair naturally.

We once had a run of huge king salmon going up the Elwha River. Some of these salmon were over 80 lbs in weight.

Once the dams are removed, there will be one of the best fisheries that would be hard to beat.

I love to fish, and just think what a boom this would be to the economy, for one thing.

People would come from far and near to fish this great river.

Just think of all of the businesses this would open. Resorts, fishing tackle stores, restaurants, boats for rent, you name it.

So my vote goes to remove the dams, the sooner, the better.

Signed
Oscar L. Ekstedt

Oscar L. Ekstedt
[illegible]
Silverdale, WA [illegible]

255

Oct 13, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt,

We must remove the Elwha and Glines Canyon dams as soon as possible. The salmon runs need to be restored and the ecosystem as well.

Please make this project a high priority in the Interior Department budget. Develop a definite action plan and timeline for the removal of the Elwha and Glines canyon dams.

Sincerely,
Edith Morgan

[illegible] Morgan
7101 [illegible] Way N.E. #305
Seattle WA 98115

10/14/93

256

3033 Eden Valley Rd
Port Angeles, WA 98362
October 11, 1993

The Honorable Bruce Babbitt
% Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Dear Mr Babbitt

I am writing to voice my support for removal of the dams on the Elwha River. I encourage you to act as swiftly as possible in order to maximize the chance of restoring the ecosystem before it is too late to do so

Sincerely,
Dottie Spring

10/14/93

SUMNER G. KENNY
30600 – 14TH PLACE SOUTH
AUBURN, WASHINGTON 98001

10/12/93

Dear Secretary Babbit

Thank you for your draft report supporting the removal of the dams on the Elwha River

I hope you will continue this effort by releasing the final report as soon as possible and including the required funds in the next budget

Sincerely

Sumner G Kenny

10/14/93

October 12, 1993

Dear Secretary —

I am very much in favor of the Elwha River Restoration plan! Please make it highest priority in the Interior Dept. budget also including the funds needed for the dam removals in upcoming appropriation requests.

Also needed is a definate action plan & timeline for the removal of the Elwha & Glines Canyon dams. Your support is needed.

Thank you —

Sincerely,
Barbara Frank

P.O. Box 792
Friday Harbor, WA 98250

10/14/93

257

October 10, 1993
790 [illegible] Drive
Burlington, Washington 98233

Honorable Bruce Babbitt,

Thank you for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring a valuable ecosystem.

Move swiftly to implement the Elwha River Restoration plan. The fish can't afford to wait any longer! Make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal & river restoration in upcoming Administration appropriation requests.

Develop a definite action plan and time-line for removal of the Elwha and Glines Canyon dams.

Sincerely,

Mrs. Richard Myers

10/14/93

Dear Secretary Babbitt

Thanks for the strong report on the Restoration of the Elwha River Ecosystem I agree — we must remove the dams

Thanks
Sincerely
Maria [illegible]

F 10/14/93

Sumner, Wa
Oct. 12, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, Wa 98362

Dear Sir,

Thank you for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you ~~that~~ we must remove the dams blocking the Elwha River, and ~~that~~ this presents a great opportunity for restoring an invaluable ecosystem

I hope you will move swiftly to implement the Elwha Restoration plan. The fish can't afford to wait any longer!

Make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests. Develop a definite action plan for the removal of the Elwha and Glines Canyon dams.

Time is running out for the fish!

Very Truly,

[illegible] M Taylor

15122 Meade-McCumber Rd.
Sumner, WA 98390

11/14/93

10/12/93

Dear Honorable Bruce Babbitt,

Thank you for the report encouraging restoration on the Elwha. I strongly agree that the dams should be removed, and that this presents a good opportunity for restoring an invaluable ecosystem. Please hurry - these fish can't wait much longer.

I hope to someday see all five species of Pacific Salmon in the Elwha. I am going to see the Grand Canyon with my family for the first time next week.

Thank you for your efforts to improve & maintain these beautiful places for my child and others of his generation.

Pat Manuel
5312 S Grattan St.
Seattle WA 98118

David Pond
23 N. Orchard Ln
Port Angeles, WA 98362

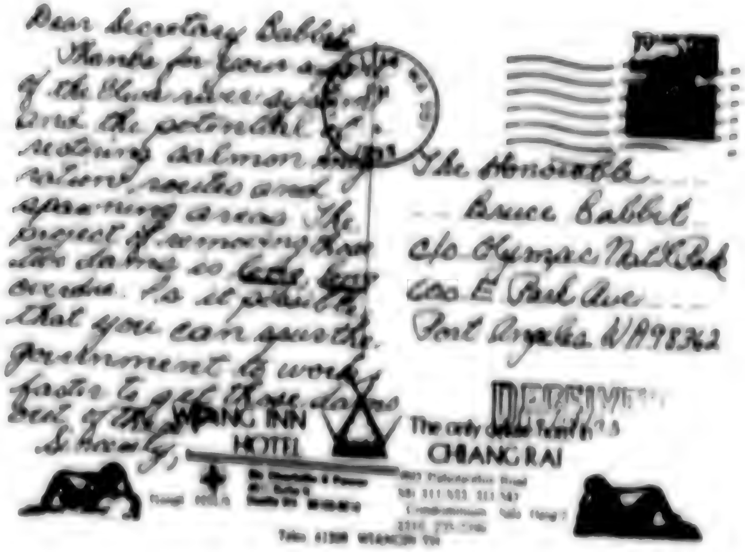
10/12/93

Dear Bruce Babbitt,

Please continue your efforts to restore the Elwha river ecosystem. I think it is time to act on saving nature for our children & future generations. I strongly support the removal of the dams.

Thank-you!

David Pond



Dear Secretary Babbitt
Thanks for your [illegible]
of the Elwha river system
and the potential
restoring salmon [illegible]
natural routes and
spawning areas. The
project of removing these
two dams is so late, long
overdue. Is it possible
that you can quicken the
government to work
faster to get these dams
out of the [illegible]
Sincerely,

The Honorable
Bruce Babbitt
c/o Olympic Nat'l Park
600 E. Park Ave
Port Angeles WA 98362

RECEIVED

gm
10/14/93

DV1

MRS. DIANE PORTER GIBBINS
701 Fieldston Road
Bellingham, WA 98225
13 Oct 1993

Sir:

Your recommendation on "the Restoration of the Elwha River Ecosystem" is supported by my husband & I.

We must remove the dams in the Elwha River.

Diane [illegible]
(Senior Citizen)

10/14/93

A. Evelyn Burke
680 Spring St. #2[illegible]
Friday Harbor, Wa. 98250

The Honorable Bruce Babbitt
c/o National Olympic Park
600 E. Park Ave.
Port Angeles, Wash. 98362

Dear Sir:

Thank you for your strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we should remove the dams blocking the Elwha. And that this presents a great opportunity for restoring an invaluable ecosystem.

I urge you to [illegible] to complement the [illegible] priority [illegible] the Interior Department budget [illegible] of the Elwha and Glines Canyon dams removal.

In addition to the economic considerations and the environmental effects I would like to put in a word for the sentimental values to be [illegible]. My first trip into the area [illegible] years ago accompanied by my father was for fishing for trout in the Elwha. It was a wonderful experience for me and one that led to [illegible] and involvement in the environmental movement. [illegible] - Now at eighty-eight years I can no longer negotiate these trips but I shall never forget the experience. The Elwha made and the deep canyon [illegible] of the restoration of the area.

Sincerely,

A. Evelyn Burke

10/18/93

5201 Erskine Way SW
Seattle, WA 98136
October 14, 1993

Bruce Babbitt
C/O Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Mr. Babbitt

Thanks for your recommendation to remove the dams blocking the Elwha River. This is a great beginning in restoring the abused environment here in the Northwest. Along with ending the insane logging practices, the removal of these dams will restore a fish run that was once part of the legacy of the Northwest environment, now almost gone. The sooner, the better.

Thanks Again,

Chris Matera

10/15/93

Dear Mr. Babbitt. Oct 13, '93

I fully agree that we must remove the dams on the Elwha river; the opportunity to restore this once great salmon river, almost wholly within the Olympic National park, is too great to pass up. Time is of the essence, the quicker this can be done the better.

What is needed now is a specific, concrete plan and timetable for removal of the two dams. Needless to say, funds for removal and river restoration must be secured in the Interior Department budget.

Again, good work on the report!

Sincerely, Charles Kellogg
2143 N. Northlake Way
Seattle WA 98103

RECEIVED
10/18/93

10/12/93

Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

PROTECT FISH/WILDLIFE & LAKES! SAVE HYDROPOWER DAMS/DON'T RE-OPEN NUKES

All other kinds of power plants create **PLASMA** to **BURN** the fuel & will release **POLLUTION & RADIOACTIVITY!** The only **NON-POLLUTING & NON-NUCLEAR POWER** we have is **HYDROPOWER!** Most **SALMON** are **DRIFTNETTED AT SEA** in International waters & across spawning streams! We cannot save salmon from nets! **FISH & EXCUSES** will create **A MANMADE ENERGY CRISIS & OPEN NUKES! BUILD FISH LADDERS TO SAVE LAKES & HYDROPOWER DAMS!**

STOP NUKES FROM RE-OPENING! KEEP & CREATE NON-NUCLEAR HYDROPOWER DAMS!

OCT 2? RECD

Dear Secretary Babbitt,

Thank you for the strong report on removal of the two dams on the Elwha River, Washington State. I am very excited that this may finally happen and believe it is an important step in restoring a small part of our river systems in WA.

Please make this project a high priority at budget making time and include funds needed for removal of these dams.

We need a definite action plan and to move forward on this as soon as possible.

Thank you

Sincerely

Linda Mester
316 E. Rice
Elma, WA 98541

RE
10/13/93

10-13

Secretary Babbitt;

I urge you to remove the Elwha and Glines Canyon dams. Ignorance created the problem of the dams and you can make an intelligent decision to remove them. Please fund their removal at the earliest moment.

Peter Giese

Peter Giese
PO 16303
Seattle, WA
98116

10/13/93

4715 Sandpoint Way NE
Seattle, WA 98105
Oct 10, 1993

Dear Secretary Babbitt,

Thank you for supporting the removal of the dams on the Elwha River. This is a unique opportunity to restore a salmon run and a watershed. Please move on this issue as rapidly as possible. The Elwha restoration should be a high priority in the Interior Dept budget soon. Please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon Dams. Thank you

Sincerely,

Jon Titus

10/18/93

2105

November 3, 1993

Dr. Brian D. Winter:
Sir, I am writing to you to voice my objection to the proposed Removal of the Elwha Dam, and the Glines Canyon Dam.

I have been a constant user of both Lake Mills and Lake Aldwell, with a majority of my usage at Lake Aldwell.
I have been paddling my Sea kayaks on Lake Aldwell since August 1983, and have enjoyed it immensely.
I paddle there all year round, even in the winter when a majority of the lake is iced over.
I have also used the lakes to train for 4 Sea kayak races in the Puget Sound Area, of which I placed quite well.

The removal of Both Dams would destroy 2 Beautiful areas that nature has created, after man has messed up the river. I do agree that the Salmon should be able to migrate up river to spawn, but not at the cost of all the Animals and Birds that have come to call the lakes their home.

My main concern is the loss of habitat for the waterbirds that call Lake Aldwell home.
The Trumpeter Swans have been calling Lake Aldwell their winter home for the 10 years that I have been there.
They use the lake, I feel primarily, because of its secluded location, and the supply of food that the river Delta does provide. I feel that these Swans chose Lake Aldwell for a purpose. They need the seclusion and the food. Removal of the Dams ~~w~~ would take away their habitat, possibly contributing to destruction of this flock of swans.

Also, removal of the Dams would take habitat away from the Osprey who use the Lake Aldwell area for food supply.

NOV 3 - RECD

The Osprey's (2) that have a nest just North of the Hwy 112 Bridge, use the Lake Aldwell area for fishing every day.
I have watched them fish there for 10 years. If, as your report says - that they can use the river again, then they would not use the lake, but they do. I feel that Lake Aldwell is an important part of their habitat, something that this nesting pair needs to survive and thrive.
You will also be depriving the Bald Eagle of its habitat on the Aldwell area, thus affecting his habitat in a negative way.
These birds can pick any area they choose to call home, yet 2 of these beautiful Eagles call Lake Aldwell their home every year.

There is also a pair of Blue Herons that fish almost ~~as~~ exclusively on Lake Aldwell for most of the year. ~~Dams~~ Removal of the Dams would also deprive these birds of their habitat.

I am in total agreement that the fish have a right to their Rivers, - But -, Dam Removal is not the way.
Fish ladders will work excellently; help to keep the costs to tax payers to a minimum; Restore the fish runs, and sustain the habitat to the Birds and Animals of Lake Aldwell and Lake Mills.
The Birds and Animals would not have chosen the 2 Lakes, if they and the habitats did not meet the needs of these creatures of Nature.

I also believe that the report "The Elwha Report" is extremely biased and slanted towards the removal of the Dams and along the thought line of the S'Klallam Indian tribe.

The tribe does need the fish, I agree, but not to the extent to net off the rivers, or to [illegible] by commercial [illegible] off of the fish.

To live off of the fish commercially is totally against aboriginal [illegible] of nature. The Aboriginal [illegible] respect for Nature dictated that you only take what you need to feed yourself and your family. Not to [illegible] from Nature.

If the fish runs survival depends on the removal of the Dams, then why is it that the fish runs on the other peninsula Rivers are doing no better. The other peninsula rivers have no Dams on them and they are doing no better than the Elwha River and its natural fish runs.

I strongly believe that if the fish runs are to come back with the ~~same~~ minimal amount of impact to nature, and the least cost to the American taxpayer, then FISH LADDERS are needed, and should be the preferred choice.

Fish ladders have worked on many dams in the world and will work on the Elwha River. The technology is there to build beautiful fish ladders that will work very well with minimal [illegible] rate for all species concerned, which ~~all~~ includes fish, Animal and Birds.

Fish ladders would also save the lakes, which are the most beautiful on the peninsula (not excluding Lake Ozette).

Lake Aldwell and Mills provide a quiet, undisturbed unpolluted atmosphere with no roads or houses to see and are about as close to GOD as you can get for atmosphere and tranquility.

Please. Please do not remove the Dams. Nature has repaired what man has altered, and has done a beautiful job of it.

Keep nature's balance, and help her out by installing Fish Ladders for Elwha Dam, and an Elevator System for Glines Canyon Dam.

Man has the technology to do so at a minimal price to nature, and Nature has the ability to help make the ~~adjus~~ adjustment to make it work.

Below are a list of Animals and Birds that live on Lake Aldwell, that I have personally seen while Kayaking on Lake Aldwell.

Common Loon
Trumpeter Swan
Common Snipe
Green Winged Teal
Wood Duck
Lesser Scaup
Buffle Head
Hooded Merganser
Common Merganser
Harlequin Duck
Canada Geese
Water Ouzel
King Fisher
Double Crested Cormorant
Osprey
Bald Eagle
Beaver
River Otter
Muskrat
Swallows

If you remove the Dams, you will be destroying the habitat of all of the above creatures. Some might make the adjustment in the change, others will not. Please don't destroy nature's correction.

Thank you

[illegible] Moses P.O. Box 418, Port Angeles WA 98362
A.A. Education A.S. Marine Technology University Hawaii
Manager Eniwetok Marine Biological Laboratory Eniwetok Atoll 1972
Marshall Islands

Rescue Elwha Area Lakes

ERRORS AND OMISSIONS IN "THE ELWHA REPORT"

CHINOOK SALMON

The report states that the Chinook salmon run has poor chance of being restored with the dams in place.

Chinook salmon travel as much as six hundred miles up the Columbia River System into Idaho over a half-dozen dams much larger than the Elwha dams. I have video tapes made from home movies of the family of Ernie Brannon, state fisheries biologist, made in the 1950s (fifty years after the dam was put in place) showing him wading out into the lower river and gaffing huge chinook salmon, while the river teemed with fish. If the dams killed the Chinook run, why did it take sixty years for it to happen?

The study describes a 6% loss of juvenile chinook going through the turbines. This is a 94% survival rate which is actually quite good. Some loss of smolt is inevitable even with no dams in place. The report also states that only about 4000 fish are returning out of 4,400,000 smolt released at the river mouth from the hatcheries. Why is a 6% loss to turbines fatal, when a 99.9%+ loss in the ocean is not? The statement that chinook cannot survive without dam removal is ludicrous - where is the data? Given the precarious state of the Chinook run at present, isn't it much more likely that the silt dumped into the lower river by a dam removal project will actually extinguish the last of the giant Elwha Chinook?

PINK AND CHUM SALMON

Pink salmon ascend into impoundments in Canada, surely they could at least get up to the area between the lakes. Getting beyond Mills seems unimportant since they will almost certainly be stopped within a mile or two by natural barriers. Is it also proposed that the river be reworked to remove these natural barriers? What evidence is there as to how far they got in the past? For the kind of money and economic loss dam removal will entail, you could build an elevator to put them up without any effort on their part.

FULL RESTORATION - *Definition?*

The report repeatedly states that full restoration of the Elwha salmon runs is possible by removing the dams. However, it gives no supporting data for this assertion, and appears to contradict itself by stating that sockeye runs probably can't be restored anyway. The law doesn't even define "full restoration", but for purposes of the study, it appears to be an attempt to recreate the Elwha valley as it was before white men set eyes on it. ???

DEMONSTRATION PROJECT

There are a number of rivers which arise in the ONP and flow mostly through pristine environment to the ocean, which have no dams. All of these rivers have salmon runs that are in trouble. If the government has a magic formula to restore runs in damless rivers, why not do a demonstration in one or more of these rivers to show that it can be done?

FISH CARCASES

On page 53, the statement," . . steelhead . . . do not die on the spawning grounds after spawning and their contribution to wildlife prey and nutrient cycling is not as great" How is it that one fish's carcass is more ecologically important than another? They all die.

FLUVIAL PROCESSES

On page 53, the statement, "current armored nature of the river". Reading this passage, one would think that a piece of gravel starts at the top of the mountain and rolls all the way down to the strait, except that it is intercepted by the lakes. Simple observation of the river says that it is constantly eating away at gravel banks, moving and depositing debris and in some cases actually changing course, and that the river between the dams contains lots of small gravel. Furthermore, one third of the water reaching Aldwell comes from tributaries which enter below Mills and which do not have dams. This statement is misleading. Actually, this "armored nature" accounts for only a hundred yards or so immediately below each dam.

This project is a blue print for environmental destruction which includes permanent loss of two lakes and their vast assortment of wildlife - some very rare. It provides for substantial damage to the river itself from which it may not totally recover (bureau of reclamation representative has stated that water quality after dam removal will never get back to what it is now). The benefits to salmon are highly questionable and negative impact on trout is certain. (Destruction of over 700 acres of trout habitat)

The project is a blue print for economic damage with power loss alone over the next 50 years amounting to at least $848,000,000, and costs of the project being nebulous, but most likely in the one quarter to one half billion dollar range.

This is why we call it a billion dollar boondoggle!

Rescue Elwha Area Lakes

SPOTTED OWLS

The statement is made on page 41 that "Removal of both dams would have no adverse impact of federally listed or proposed species" This requires explanation. This project will involve use of heavy equipment, blasting and probably some logging in spotted owl habitat, over a long period of time. It would appear that this whole project will be a gross violation of the government's own rules which forbid any disruptive activity in owl environment ???

TRUMPETER SWANS

This project will destroy the winter habitat for trumpeters on Lake Aldwell. Are not these rare and majestic birds at least as important as spotted owls? The study provides no answer to this problem.

WATER TEMPERATURE

The report repeatedly cites the 2 to 4 degree summer warming of the river water as the cause of an often fatal parasite infestation in chinook salmon. Yet, they have no scientific proof for this statement. Water temperatures in the Columbia river system often are much higher than Elwha river temperatures. Based on this statement, chinook should not survive in the Columbia at all. Also, why did this only become a problem in recent years? The Elwha chinook run was very healthy for some 50 years (about 12 to 16 salmon generations) after the dams were put in place. A fish and wildlife representative explains that it is due to the massing of fish in the lower river, but failed to explain why the much greater massing of fish thirty years ago did not cause such a problem.

SOURCES

The Act gives authority (and implied obligation) for the Interior Secretary to use any other government agencies for this study. Why is it that we see no imput from the US Army Corps of Engineers who have no doubt built more fish passages around dams than anyone else in the world. Isn't this a case of "My mind is made up, don't confuse me with the facts?" No engineering studies were done. Brian Winter admits he is not an authority on fish passages and could not identify any fish passage authority in his team. Clearly, the fish passage issue was decided before the study even started.

AQUIFERS

At a depth of some 145 feet, the water pressure at the bottom of Mills should be around 65 pounds per square inch (9300 pounds per square foot) Given the jumbled geology of the Olympic Peninsula, there has to be considerable injection of water into underground aquifers. The report gives no data on where these aquifers go and who's well will be affected. Bureau of Reclamation representative agrees this may be so, but no studies were done to find out, and it is unlikely such studies could very accurately predict results anyway. We just have to "take our chances" Will the government compensate people who's wells go dry because of this boondoggle?

OCTOBER 14, 1993

THE HONORABLE BRUCE BABBITT

I AM WRITING TO THANK YOU FOR YOUR STRONG SUPPORT OF THE RESTORATION OF THE ELWHA RIVER ECOSYSTEM. I STRONGLY AGREE THAT WE MUST REMOVE THE DAMS BLOCKING THE ELWHA RIVER. THIS ACTION WILL PROVIDE AN IMPORTANT OPPORTUNITY FOR THE RESTORATION OF AN INVALUABLE ECOSYSTEM AGAIN. THANK YOU FOR YOUR SUPPORT

SINCERELY,

Lori K Phillips

LORI K. PHILLIPS
6528 17th AVE NW
SEATTLE, WA 98117

269

October 13, 1993

Dear Honorable Bruce Babbitt

I am writing to you about dams on the Elwha River. I support and agree with you that the dams blocking the Elwha River must be removed. The removal of these dams present a great opportunity for restoring an invaluable ecosystem.

Please develop and enact a definite action plan and timetable for the removal of the Elwha & Glines Canyon dam. Please act quickly, the fish can't afford to wait any longer.

I know this action, like other needed environmental actions will cost money. Higher gasoline taxes would be great revenue source. This taxpayer does not mind higher taxes if it means a better environment.

Sincerely

Jeffrey May

Jeffrey A. May, CPA
919 Fifth Ave #4
Kirkland, WA 98033

RECEIVED 10/19/93

5012 13th Av West
Kirkland WA 98033
10-13-93

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Av
Port Angeles WA 98362

Dear Sir:

Thank you for your positive report on the Restoration of the Elwha River Ecosystem. Please move forward in removing the dams and restoring this fine river to its former ability to host runs of salmon and steelhead.

Sincerely,

Gerald A. Eller

RECEIVED 10/19/93

270

October 10, 1993

Dear Secretary Babbitt,

We urge that you support the Elwha River Restoration plan by giving it high priority in the Interior Department budget The removal of the dams will allow the restoration of what was once the home of prolific runs of several kinds of fish that should be a part of the Olympic National Park

Sincerely,

Roy Dubisch

Roy Dubisch

Joyce M Dubisch

210 Manito Drive
Mt. Vernon, WA 98273

271

Dear Secretary Babbitt 10/12/93

I urge you to support removal of the Elwha River dams. This seems like such a unique opportunity to recreate a wild free flowing river in a world where there are fewer and fewer every year. As a life time resident of the State of Washington I have watched first hand the not so slow steady destruction and alteration of the natural environment of this beautiful part of the world. I fished and hiked along the banks of the Elwha years ago and I encourage you especially since one these dams lies within the boundaries of the National Park to return this river to its natural state and to at least let nature attempt to reclaim it, so that those that follow us can experience these wonders of nature as they were intended to be.

Sincerely

Gary Nichols
1604 Yew St.
Bellingham Wa

| 10/15/93 jw

10/15/93

2771

(Mrs.) Wanda Durkoop
530 W. 12th Street
Port Angeles, WA 98362

The Honorable Bruce Babbit
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

I strongly support removal of the dams on The Elwha River in Port Angeles, Washington. The abundant runs of fish in the river need to be restored.

In order to make this happen, please do three things:

1. Move swiftly to implement the Elwha River Restoration plan.
2. Give it top priority in the Interior Department's budget.
3. Develop an action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Thank you for your help on this important issue.

Sincerely,

DEAR MR WINTER:

PLEASE ANSWER THESE QUESTIONS SPECIFICALLY.

1. HOW MUCH SEDIMENT THAT ACCUMULATED IN THE PONDS ABOVE THE DAMS?
2. DO YOU PLAN TO FLUSH IT DOWNSTREAM? WOULD THIS FOUL THE REST OF THE RIVERBED, THUS REQUIRING HYDRAULIC ACTION ON THE WHOLE LENGTH OF THE RIVER?
3. WHAT IS THE COST-BENEFIT RATIO IN TERMS OF DOLLARS PER-SPAWNING-FISH (FEMALE)
4. WHERE ARE YOU GOING TO PUT THE DEBRIS? WHAT ENVIRONMENTAL IMPACT WILL THIS HAVE?
6. HOW MUCH OF THE ON-GOING ADMINISTRATIVE COSTS WILL BE ALLOCATED TO STATISTICS OF ACHIEVEMENT, AND WILL A FAILURE BE ADMITTED, IF IT SO HAPPENS?

B W CONANT
5451 35th AVE SW
SEATTLE WA 98126

m
10/12/99

m
10/15/99

814
Eagle Ridge Rd.

Mr. Winter—

In response to the newspaper article the other day for comments, this is to indicate our preference for a return of the Elwha River to a free flowing condition by complete dam removal. Among our friends we know of only one who feels otherwise.

We are certainly hopeful this will be the final decision reached.

— Margaret, Jay, Kurt,
Richard Olson

10/6/93

October 6, 1993

Mr. Brian D. Winter
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362-6757

Dear Mr. Winter:

I got your name from the Seattle Times article about the possibility of removing the dams on the Elwha River.

I understand from the article this may be a fairly expensive proposition. Be that as it may, removing the dams is a worthwhile project and one that deserves to be funded. We spend a hell of a lot of money trying to protect the fish we do have left; I don't believe we spend a lot trying to bring "new" fish to Puget Sound.

We all know how important fishing is to the local economy, and how salmon were once the dietary mainstay of the natives. Given that the Interior Department's report concludes removal of the dams would give most Elwha salmon stocks a good or excellent chance, I think it would be foolish not to find the money somewhere to remove the dams.

Thank you for the opportunity to express my views.

Sincerely,

IV

John H. Stewart, IV
4036 - 52nd S.W.
Seattle, WA 98116-2923

10/7/93

October 13, 1993

The Honorable Bruce Babbitt
Secretary of Interior
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, Washington 98362

Re: Restoration of Anadromous Fish Runs
on the Elwha River

Secretary Babbitt,

Thank you for supporting the removal of the Elwha and Glines Canyon dams from the Elwha River. This river is in one of the most stunning areas of our Pacific Northwest and has the opportunity to provide the country with one of nature's splendors - five native Pacific salmon runs. The removal of the dams is an opportunity to correct a mistake that has been perpetuated since the early 1900s.

Swift implementation of the Elwha Restoration Plan will support the possibility of restoring all five species of Pacific salmon to the Elwha. Please work to insure the inclusion of funds for the removal of the dams and for river restoration in the upcoming Administration appropriation requests.

I also encourage the creation and implementation of a definite action plan and a timeline for the removal of the Elwha and Glines canyon dams.

Sincerely,

Sharon E. Brown

Sharon Brown
2125 30th Ave. South
Seattle, Washington 98144

October 14, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Avenue
Port Angeles
Washington

Dear Secretary Babbitt,

Thank you for your strong report on the Restoration of the Elwha River Ecosystem! Having lived in the State of Washington for 30 years and seen decades of environmental destruction on a massive scale, it is reassuring to see any movement in the opposite direction. I applaud your efforts to reclaim and restore the Elwha ecosystem.

I agree with you that we must remove the dams blocking the Elwha River. Since the salmon have been devastated almost to extinction, I encourage you to implement the Elwha River Restoration plan immediately and to make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests. A definite action plan and timeline for the removal of the Elwha and Glines Canyon dams would be very helpful.

Very truly yours,

John & Alexis May

John and Alexis May
214 130th Avenue N.E.
Bellevue
Washington 98005

P.S. No reply is necessary to this letter. We receive information locally on the Elwha from several sources.

ED. MARKHAM
Horticulturist
26418 Yale Court · Kent, Washington 98032 · Phone · FAX (206) 852-3375

DATE 13/Oct/93

SUBJECT Elwha dam
Sequim, wa.

Honorable Bruce Babbitt
c/o olympic Nat. park
600 E. park ave
Port angeles, wa
98362

Dear Secretary Babbitt.

Yes I know Elwha, and even had family working at the "hatchery". YES eliminate Elwha dam!!! at once. another little job for displaced logger

Sincerely

Restore the Elwha

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park
600 E. Park Ave.
Port Angeles, WA 98362

11 October 1993

Dear Secretary Babbitt,

You will go down in my book as the greatest Secy of the Interior our country has ever had if you can really truly get Congress to release funds to get rid of those Elwha dams.

The sound of that dynamite going off will be greater music than Mozart & Beethoven combined could have dreamed up.

Go for it, Bruce!

Laura

P.S. Call if you need help 206-842-8465

Laura Livingston
4120 Pt. White Drive N.E.
Bainbridge Is., WA 98110

10/10/93

418 Pioneer St
Enumclaw, WA 98022
Oct 12, 1993

Dear Mr. Babbitt,

Thanks for the strong report on the Restoration of the Elwha River Ecosystem. Please move swiftly to implement the restoration plan and make it a high priority in the Interior Dept. budget

Thank you -
Cheryl A Roberts

Oct. 13, 1993

Honorable Bruce Babbitt

Please move swiftly to implement and budget the Elwha River Restoration with a definite plan of action for removal of the Elwha + Glines Canyon dam.

I appreciate your strong report on the Elwha River Ecosystem. My husband + 6 grown children agree with you and hope for your success in budgeting needed funds + action

Sincerely,

Luanna Iverson
3609 72nd Place SE
Mercer Island, WA
98040

October 13, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Secretary Babbitt

Thanks for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

I would also like to urge you to: move swiftly to implement the Elwha River Restoration plan; make the Elwha a high priority in the Interior Department budget; develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Sincerely,

10/13/93

Hope Nije

---

13 OCT 93

I support the removal of the two Elwha dams. These removals will start the rebirth of the river ecosystem and the runs of Elwha salmon and steelhead.

Your continued support of this project is applauded and encouraged. Thank you.

10/13/93

Sharon Pickett

[illegible] 4, 1993

DR. BRIAN W. WINTER
% OLYMPIC NATIONAL PARK
600 EAST PARK AVENUE
PORT ANGELES, WA 98362

IT WOULD APPEAR THAT A FINE OPPORTUNITY IS AVAILABLE TO CORRECT A MAN-MADE ENVIRONMENTAL ERROR EXISTING SINCE 1911.

THE PRISTINE NATURE OF THE UPPER ELWHA RIVER SPAWNING GROUNDS (EXCLUSIVE WITHIN OLYMPIC NATIONAL PARK PROTECTED AREA) DOES SEEM TO BE THE HOPE OF A GOOD CHANCE FOR THE RESTORATION OF THE ELWHA RIVER ECOSYSTEM AND THE NATIVE FISH RUNS.

IT WOULD SEEM THAT DAMS OF THIS AGE WOULD HAVE A FINITE NUMBER OF SAFE YEARS OF USAGE WITHOUT MAJOR REPLACEMENT OR REPAIRS — IF ANY EVENT — EVEN WITHOUT THE ADVENT OF A MAJOR EARTHQUAKE.

LOTS OF COOPERATION APPEARS TO HAVE RESULTED IN PUBLIC LAW 102-495. I WOULD HOPE THAT THAT - PLUS THE FOLLOW-UP OF THE "DEFINITE PLAN" FOR REMOVAL OF THE ELWHA AND GLINES CANYON DAMS WOULD SEE THE REMOVAL OF THE DAMS AND THE ECOSYSTEM RESTORATION AS ONE OF THE MORE THOUGHTFUL AND CARING ACTIONS TAKING PLACE IN THE PACIFIC NORTHWEST IN THE IMMEDIATE FORTHCOMING YEARS!

CARRY ON!

Hubbard E. Yeoman
302 [illegible] Lane
Sequim, WA 98382

10/19/93

Oct 17, 1993

The Honorable Bruce Babbitt
Secretary of Interior

Dear Mr. Babbitt

The longest and most beautiful of all 27 streams on the Olympic Peninsula is about to lose the last remnants of it's once abundant runs of anadromous fish. The two dams have just about choked the lifeblood from most of the runs. Over 95% of the Elwha River and it's tributeries lie within the Olympic National Park and has a perfect chance to be restored by removing the dams.

For the last 50 years I have hiked, camped and fished the complete length of that river and know its potential. By contrast all of the other streams on the Peninsula have lost most of their potential to produce fish because of logging, roads and other human intrusions. Now is the time - don't wait any longer.

Sincerely Yours,
R.W. Dalton

[illegible]
[illegible] Angeles WA 98362

rcvd 10/18/93

RECEIVED
MAIL ROOM
93 OCT 18 AM 11:49

570 Hulme Road
Port Angeles, WA 98362
October 14, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babitt:

I am in favor of removing the dams on the Elwha River and restoring the river to its former healthy state. I urge you to give high priority to this project in the Interior Department's budget and develop a definite action plan which will insure the early removal of these dams so that salmon runs can be restored.

Thank you for your consideration.

Sincerely,
Charles D. Louch
Charles D. Louch

RECEIVED
MAIL ROOM
93 OCT 18 AM 11:49
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 15, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Re: Elwha River Restoration Plan

Dear Secretary of the Interior:

Thank you for your strong support on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove both the Elwha and Glines Canyon dams blocking the Elwha river in order to fully restore the ecosystem and native anadromous fisheries. Currently, there is a great opportunity to restore this invaluable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan by making the plan a high priority in the Interior Department budget. I urge you to include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Again, I urge you to move forward to develop a definite action plane and timeline for removal of the dams. The fish can't wait any longer!

Sincerely,

Kathryn A. Miller
4121 Dayton Ave. N.
Seattle, WA 98103

10-16-93

Dear Mr. Babbitt-

I seriously urge you to sincerely continue your efforts to remove the dams from the Elwha river in Washington state.

Please include funds for this project in your Interior Dept requests in upcoming Administration appropriations.

The entire ecosystem here needs protecting immediately and we need your help desperately.

Sincerely—

482 Burnt Ridge Rd.
Onalaska, Washington
98570

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park
600 E. Park Ave.
Port Angeles, WA
98362

October 15, 1993

RECEIVED
MAILROOM
93 OCT 18 AM11:50
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt

Thanks for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan. The fish can't afford to wait any longer!

Please make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Thank-you for your pro-environmental stands.

Sincerely,

Barbara Roberts

Barbara Roberts
503 Rhododendron Drive
Vancouver, WA 98661

Oct 15 1993
119 Hawthorne
Wenatchee, WA
98801

Bruce Babbitt
Sec of the Interior

RECEIVED
MAILROOM
93 OCT 18 AM11:51
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Dear Secretary Babbitt

Thank you for your leadership regarding the Elwha Dam problem.

Please move quickly to see that a restoration plan is in place.

I am a 57 year old retired superintendent of public school districts in Wash. State and am also a person who knows the Olympic Peninsula well. I have hiked since I was a child.

To have observed the rape of the trees in the Big Quilcene area and others has been bad enough. But to acquiesce in continuation of the dams is unconscionable.

Thank you for your efforts

Sincerely,

Dennis L Peterson
Dennis L Peterson

16 Oct 1993

RECEIVED
MAIL ROOM
93 OCT 18 AM 11:51
OLYMPIC NATIONAL PARK

Honorable Bruce Babbitt
Olympic National Park
Port Angeles, Wash 98362

Wouldn't it be great to be able to give "Mother Earth" back something that we humans destroyed in the "blink of an eye" - something that took her thousands & thousands of years to create.

Please press forward on the Elwha River Restoration plan. I don't live in the immediate area but I would like very much to be able to visit this area in the future and see those beautiful Salmon and Steelhead running the Elwha River.

Thank you for you support - It is greatly appreciated.

Max & Shirley Kitterman

Max & Shirley Kitterman
E. 22821 Harvard Branch Rd
Rockford, WA 99030

RECEIVED
MAIL ROOM
93 OCT 18 AM 11:51
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 14, 1993

The Honorable Bruce Babbitt
Secretary, Department of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, Washington 98362

Dear Secretary Babbitt:

Thank you for your support of the plan to remove the dams on the Elwha River so that salmon runs may be restored to the river and its watershed in Olympic National Park.

I hope you will be able to move forward with the restoration plan quickly enough that the few indigenous pink salmon will be able to rebuild their numbers. I hope funds will be made available as quickly as possible for the removal and restoration work.

Again, thank you for your support of this unique opportunity to revitalize the Elwa ecosystem.

Yours sincerely,

Dennis J. Konshak

Dennis J. Konshak
2102 S. 69th Ave.
Yakima, Washington 98903

10·14·93

RECEIVED
MAILROOM
93 OCT 18 AM 11:52
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Dear Secretary Babbitt,

Thank you for The strong [illegible] Restoration of The Elwha River Ecosystem. I Am in agreement w/ removing The dams blocking The Elwha River. This is a great opportunity for restoring an ecosystem.

Please move swiftly To implement The Elwha River Restoration Plan. Time is certainly running out for The Pacific Salmon, & it appears That The Sockeye population is already gone. It is Truely a sad & Tragic story, in a land & river That used To Team with life.

Please make The Elwha a high priority in your budget - To include funds needed for dam removal & river restoration.

Please develop a definite Action plan & Timeline for The removal of The dam. And please know you have my support & many other people's support.

Sincerely,

Terri L Huber
185 Kentwood Ct
Richland WA 99352

283

JOHN E. EDISON
ATTORNEY AT LAW
P.O. BOX 667
STANWOOD WA 98292
(206) 387 7024

RECEIVED
MAILROOM
93 OCT 18 AM 11:52
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

14 OCT 93

Dear Sec Babbitt

Thank you for supporting The restoration of The Elwah River. please deve, a definite timetable for removal of both dams. Please include The needed fund for dam removal and river preservation in The Interior Dept. Budget.

Yours truly,

John Edison

283

RECEIVED
MAILROOM
93 OCT 18 AM 11:52
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
℅ Olympic National Park
600 E. Park Ave.
Port Angeles, WA. 98362

10/14/93

Dear Mr. Babbit,

Thanks for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan. The fish can't afford to wait any longer! Make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests. We need to respect nature and pay the costs to rectify our past mistakes.

Please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Sincerely,

Marilyn Mahoney

Marilyn Mahoney
46 Salmon Beach
Tacoma, Wa. 98406

RECEIVED
MAILROOM
93 OCT 18 AM 11:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Barton Parrott
3411 Wallingford Ave. N.
Seattle, WA 98103

October 11, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt,

I am writing to support the removal of the dams on the Elwha River on the Olympic Peninsula in Washington. This is a great opportunity to restore this ecosystem. I urge you to work to implement the Elwha River Restoration plan and to make the Elwha a high priority in the Interior Department budget.

This is too good a chance to miss -- a great opportunity to do something intelligent to save an important resource. Please work to remove the Elwha and Glines Canyon dames!

Sincerely,

Barton Parrott

Dear Secretary of Interior:

Thanks for your support on restoring the Elwa River. I agree that the dams should be removeD so the Salmon runs have a chance of surviving. Please make the Elwha a high priority in the Interior Department budget. A plan for removal of the Elwha & Glines Canyon must be implementeD as soon as possible.

Sincerely,

12615 94th Ave NE
Kirkland, WA 98034

RECEIVED
MAILROOM
93 OCT 18 AM 11:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Joan Carson
P.O. Box 217
Poulsbo, WA 98370
(206) 779-2612

RECEIVED
MAILROOM
93 OCT 18 AM 11:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 15, 1993

Bruce Babbitt, Secretary of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt: Re: Elwha River Restoration Act

It is my understanding that you strongly support the restoration of the Elwha River ecosystem with the removal of the two Elwha dams. I do commend you for putting the health of the resource first. This is the only way such resources can be returned to some semblance of what they once were. In the long run there can only be benefits from such actions.

I would urge you to move immediately to implement the restoration plan for the Elwha. This state's fish runs have suffered to the point where waiting is almost tantamount to destroying them.

Thank you for supporting something so important to the Northwest.

Sincerely,

Joan Carson

Joan Carson, Columnist

RECEIVED
MAILROOM
93 OCT 18 AM 11:54
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 16, 1993

Hon. Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles WA 98362

Dear Sir,

We are writing to express our appreciation of your support of the removal of the dam on the Elwha River in Olympic National Park.

As former educators in Yosemite National Park, we spent years teaching about the values and precedence set by the damming of the Tuolumne River in the Hetch Hetchy Valley. That dam broke John Muir's heart. By destroying the dam on the Elwha, we can begin to set things right again and establish a new precedent of restoring a river to its wild and free nature.

We urge you to move swiftly to implement the Elwha River Restoration Plan, and to make this an extremely high priority within the Interior Dept. In an era of tight budgets, we recognize that this will be difficult. But we have a sensitive president, a democratic congress and a great ally in you. The time to move is now to restore a legendary salmon run and to make right the wrongs of the past.

Just think how proud and pleased John Muir would be!

Respectfully,

Peter A. Speer
1520 2nd Street
Kirkland WA 98033

Marian W. Osborne
Marian W Osborne

cc: President Bill Clinton
Hon. Senator Patty Murray
Hon. Senator Slade Gorton

RECEIVED
MAILROOM
93 OCT 18 AM 11:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

6426 Waldon Dr. SE
Olympia, WA 98513
October 15, 1993

Dear Secretary Babbitt,

Thank you for your strong report regarding the restoration of the Elwha River ecosystem. I hope you will follow this with sufficient funding to accomplish the swift removal of the dams.

It is so good to finally have an environmentally-aware leader in the Interior Department. You have our whole-hearted support.

Sincerely,
Peggy Ann Dardin

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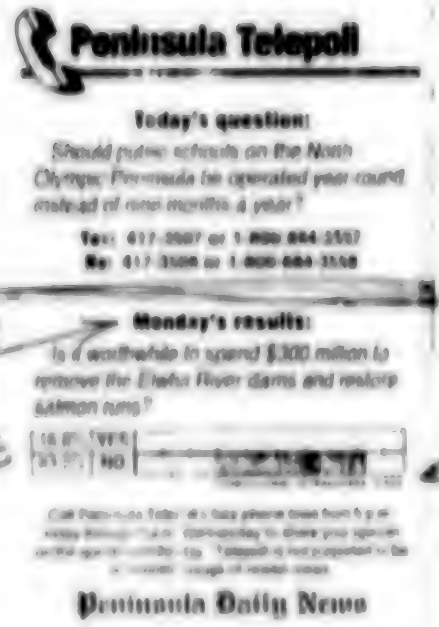
PAGE



Peninsula Telepoll

Today's question:

Should public schools on the North Olympic Peninsula be operated year round instead of nine months a year?

Yes: 417-3507 or 1-800-884-3507
No: 417-3508 or 1-800-884-3508

Monday's results:

Is it worthwhile to spend $300 million to remove the Elwha River dams and restore salmon runs?

YES
NO

Peninsula Daily News

Oct 19-1993

final result

total responses

Dear Mr. Webster
Local paper quoting you as saying opinion was evenly divided as to retaining or removing the dams.
The percentage of no votes would have been greater had not many dam supporters been in attendance at the workshop and had yet to read the paper. The phone survey is conducted between 5-7 PM
Wishing you no success
B. L. Adamire
Advisory Member
Rescue Elwha Area Lakes

10-12-93

Honorable Bruce Babbitt;

I received a mailing recently from the Friends of the Earth concerning the Elwha river & the proposed dam removal to restore ancient salmon runs. The mailing failed to include the cost of the project, an accurate estimate of the numbers of fish that will return, a cost per fish estimate, or any information about the beauty & recreation uses of the lakes that will be lost.

It is difficult to believe that in these days of money crunch, we can't find a better use for the money.

Gary [illegible]
10/14/93
274 Tonda Vista, Port Angeles, WA 98362

10-14-93

Mr. Babbitt!

Thank you for seeing the common sense necessity of removing the dams that block the Elwha River. Thank you for your actions that tell our children & grandchildren and our earth, fish, etc., "We care." Please move swiftly to see the plan through right away, with no delays due to money or politics. Time is of the essence, as I'm sure you know! Just listen to & look at the younger generation. They're scared, understandably, have little hope out of our greed results.

Thank you!

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MAILROOM
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…NATIONAL PARK
…98362

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park
600 E. Park Ave.
Port Angeles,
WA 98362

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RECEIVED
MAILROOM
93 OCT 19 AM 11:05
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Mr. Bruce Babbitt
Sec of the Interior

17 Oct 1993

Dear Sir,

I am delighted with your strong support of removing the dams and restoring the ecosystem on the Elwha River, which I have camped & fished. The project should move to high priority not just for its own sake, but because of its great symbolic value [illegible] as demonstrating that mistakes of the past can be undone.

Sincerely,

Barbara + Woody Sullivan

288

We're already on the mailing list. Please save postage by not sending anything.

RECEIVED
MAILROOM
93 OCT 18 AM11:47

OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

USA 19

Superintendent [illegible]
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

10/15/93

Dear Sec. Babbitt,

Thank you for supporting the Restoration of the Elwha River Ecosystem. It will be expensive but invaluable in the long run. What an opportunity to make sure that Washington will always have a salmon industry - a rich ecosystem! Sincerely, [illegible]

Annabelle T Reed
4203 No. 27th
Tacoma, WA 98407

RECEIVED
MAIL ROOM
93 OCT 19 AM 11:47

Fort Recovery, Ohio 19 USA

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park ave.
Port Angeles Wa 98362

Dear Secretary Babbitt: 10-14-93

This is to let you know that I support removal of the Elwha dams.

It is most important that fish such as steelhead & Elwha salmon be restored as they were in the past before these dams caused such damage to the natural ecosystem.

Sincerely
Annabelle Reed

(I'm already on your mailing list.)

RECEIVED
MAIL ROOM
93 OCT 18 AM 11:47
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

USA 19

The Hon. Bruce Babbitt
c/o Oly. Nat'l Park
600 E Park Ave
Port Angeles WA 98362

10/14/93

Dear Secretary Babbitt,

Your support for the Elwha River Restoration plan is commendable. As the next step, please continue your support and include the funds needed for dam removal and river restoration in the upcoming budget considerations.

A plan is urgently needed for action/time table for both the Elwha & Glines Canyon Dams -

thank you -
Edward A.

H. Smith
[illegible] 17th Ave. [illegible]
Seattle, WA
[illegible]

Secretary of Interior
Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

USA 19

RECEIVED

Dear Secretary of Interior
Bruce Babbitt: Oct. 14. 1993

I am writing to thank you for the strong report on the restoration of the Elwha river ecosystem! I agree that the dams must be removed. it is a wonderful opportunity for restoring a very invaluable ecosystem. In addition I urge you to include funds needed for dam removal & river restoration in the upcoming Administration appropriation requests. I also encourage you to develop a definite action plan and timeline for removal of the Elwha & Glines Canyon dams.

Sincerely,

Heide Smith [illegible]

11221 92nd Pl NE
Kirkland, WA 98034
October 15, 1993

RECEIVED
MAILROOM
93 OCT 19 AM 11:05

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave.
Port Angeles, WA 98362

Dear Sir,

Thank you for your strong support on the restoration of the Elwha River ecosystem. I am hoping it can have high priority in the upcoming Interior Dept. budget so that your action plan can begin as soon as possible. The fish can't afford to wait.

Sincerely,
Mary Lou Constans

10-17-93

RECEIVED
MAILROOM
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OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Dear Honorable Babbitt,

Thanks for your strong support on the Restoration of the Elwha River Ecosystem. These dams blocking the Elwha River must finally be removed. Please make the Elwha a high priority in the Interior Department budget. The funds needed for dam removal and river restoration should be included in the upcoming Administration appropriation requests. Also, please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams. Move swiftly to implement the Elwha River Restoration Plan.

Sincerely,
Kurt Sontag
23820 30th Ave. S., #A1
Kent, WA 98032

20 October 1993

Hon Bruce BABBITT
RE: ELWHA RIVER RESTORATION

Dear Sir:

Please expedite the restoration of the Elwha River.

I would be pleased to donate my labor to help remove the Elwha and Glines Canyon Dams brick by brick if it would help speed the process.

Sincerely,

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MAILROOM
93 OCT 19 AM 11:05
OLYMPIC NATIONAL PARK
PORT ANGELES WA 98362

294

McGAVICK GRAVES
ATTORNEYS AT LAW

RECEIVED
MAILROOM
93 OCT 19 AM 11:07
OLYMPIC NATIONAL PARK
PORT ANGELES WA 98362

October 18, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Re: Eliminating Elwha River Dam

Dear Secretary Babbitt:

For so long, through so many administrations, I have heard so much talk but have seen so little action regarding taking positive steps to preserve valuable ecosystems. You are the first Secretary of the Interior that has shown he is willing to take a stand and let his actions speak louder than his words. I want to thank you for what you are doing to restore the Elwha River Ecosystem.

I respectfully request that you move swiftly to implement the Elwha River Restoration Plan. This includes making this project a high priority in your Department's budget and developing an action plan for the prompt removal of both the Elwha and Glines Canyon Dam.

Thanks again for being willing to take a stand to restore, preserve and protect this irreplaceable ecosystem.

Sincerely,

Loren D. Combs

LDC:dmc

[LDC\Babbitt.Ltr]

294

BEST COPY AVAILABLE

Howard A. Pellett
10417 NE 197th Street
Bothell, WA 98011
(206) 220-5631 wk(206) 486-8726 hm

RECEIVED
MAIL ROOM
93 OCT 19 AM 11:07

October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Dear Honorable Babbitt

Thanks for the strong report on the Restoration of the Elwaha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosytem.

Please move as quickly as possible to implement the Elwha River Restoration plan. The fish can't afford to wait any longer!

Please make the Elwha a high priority in the Interior Department budget. Please inlcude the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Thank you for considering my views.

Sincerely,

Howard A. Pellett

Howard A. Pellett

[illegible]

RECEIVED
MAIL ROOM
93 OCT 19 AM 11:07

18 October 1993

The Honorable Bruce Babbitt
C/O Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Re: Elwha River Restoration

Dear Secretary Babbitt:

This letter is written to urge you to follow up your positive draft report concerning the removing of the two dams from the Elwha River with a similar final report and a time table for quick action on this project. Please include in your budget request the necessary funds to complete the removal of these dams.

We have written previously to members of the preceding federal administration and members of Congress on this issue. We believe that removing these dams will be a giant step forward in recognition of the fact that serious errors were made in the past. Because of possible lack of understanding or usual human greed, these dams were permitted to be built in an ecosystem that was truly a gift from God. Where else is there a river system that provided such a bounty of fish so close to a major population center? Over time, after removal of these dams, the Elwha River will again be a "basket of fishes" that will attract the worldwide interest of sport fishing aficionados. Any purported economic loss that the dam removal may cause will be more than made up when the Elwha River system is restored to its former pristine beauty.

You have an unparalleled opportunity to set an example for mankind to follow in the future. Before humankind tampers with a natural ecosystem by imposing on it an ill-conceived intrusion such as the Elwha dams proved to be, all of the environmental consequences will be honestly considered. Please rise to this occasion as soon as possible.

Yours Truly,

Harry Hubbard

Harry Hubbard
1416 11th W.
Seattle, WA 98119

RECEIVED
MAILROOM

93 OCT 19 AM 11:00

OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

3764 E. Bancro[illegible]
Port Orchard, WA 98366

October 14, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Sir:

Today, I would like to thank you for the strong report on the restoration of the Elwha River Ecosystem. The removal of the dams presents a great opportunity for restoring a priceless ecosystem. Please make the Elwha a high priority in the Interior Department's budget; that is, include the funds needed for dam removal and river restoration in upcoming administration appropriation requests. It is important to develop a definite action plan for the removal of the Elwha and Glines Canyon dams.

At this time, I would also like to tell you how pleased I am that President Clinton chose you as Secretary of Interior. Over the past six months, I have read quite a few articles about you--all of which depicted you as a person who cares for our environment and the creatures that depend on it.

Respectfully yours,

Hildegard Pennington
Hildegard Pennington

Hon. Bruce Babbitt
C/o Olympic Nat'l Park
600 E. Park Ave.
Port Angeles, WA

Regarding: Elwha River Dams in Olympic Nat'l Park

Dear Sir: I support restoring the salmon runs in the Elwha, but - the T.V. News says the dismantling of the larger Dam will cost 125 million Dollars -

I certainly do not support anything like that - it sounds like a massive, massive boondoggle.

The total stream flow could be made into a great & fully effective fish ladder for many times smaller dollars than that.

Sincerely
John W. Kerr
521 Mason Drive
Olympia WA
98506

10/19/93

296

10-13-93

Mr. Brian Winter —

In regards to the Elwha Restoration project my concern is the other rivers with no fish returns and they have no dams. Absolutely no one should be netting within 500 yards of the mouths of rivers, that includes Indians as it also affects them too.

In removing the dams it will take Billions of dollars and then more to rebuild the fish return and many years also.

The people logging should be banded from roads and timber cutting 200 ft away from streams and not any water sheds. It seems there ought to be a less expensive way to fix things. Also the power loss.

Regards

Alvin Eckley

10/19/93

RECEIVED
MAILROOM
93 OCT 19 AM 11:08
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 14, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Sir:

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. We are in complete agreement that we must remove the dams blocking the Elwha River. It was a big mistake to build the two hydroelectric dams on the river. Built without fish ladders blocking the access for salmon and steelhead. Time is running out for the fish. We urge you to move swiftly.

We urge the administration to move forward quickly, to submit the final report and to include Elwha restoration funds in the upcoming budget. We are concerned about this and suggest that a definite action plan and time-table be established for the removal of the Elwha and Glines Canyon Dams.

Thank God we have an administration that is concerned about our ecosystem and is willing to take action on these grave matters. There is no excuse to destroy the natural river ecosystem in order to provide electric power for privately owned business. We look forward to the time when the fabled runs of Elwha salmon and steelhead return to the river.

Sincerely yours,

Mrs. Alan H. Hansen

Mr. & Mrs. Alan H. Hansen
P. O. Box 2485
Port Angeles, WA 98362

897

Dear Sir:

I'm writing in response to your article in the Oct. 3 Evening news.

I, for one do not want the dams removed. Before you remove them you should try and get the fish to come back to the rest of the other rivers we have. The fact of the matter is there is just no fish - We are to good at catching them - the 35 mile long drift nets, the commercial fisherman and the Indians all take to many fish.

I believe your cost estimate will turn out to be closer to 300 - 350 million rather than what you say and we just don't have the money

ARTHUR MOORE

thank you
Art Moore

10/19/93

RECEIVED
MAILROOM
93 OCT 19 AM 11:09
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

11 October 1993
2416 N. 43rd St.
Seattle, WA 98103

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt:

I am writing to express my appreciation for the strong report you gave on the Restoration of the Elwha River Ecosystem. I agree that we must remove dams blocking the Elwha so that we may have the opportunity to restore this important ecosystem.

Please keep up the good work by: 1) moving quickly to implement the Elwha River Restoration plan - we cannot afford to lose more fish; 2) making this project a high priority in the Interior Department budget in the upcoming Administration appropriation requests; and 3) developing a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Thank you again for your support. I look forward to hearing about progress on this project in the near future!

Sincerely,

Anne James

Anne James

9623 S 205th Pl
Kent, WA 98031
October 18, 1993

RECEIVED
MAILROOM
93 OCT 19 AM 11:09
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Secretary Babbitt:

I would like the Department of Interior to move quickly on implementing the Elwha River Restoration Plan and to remove the Elwha and Glines Canyon dams. The dams need to be removed as soon as possible so the salmon and steelhead runs can be restored.

Thanks for the good report on the Elwha restoration. Please develop a timetable for removing the dams and restoring the Elwha as soon as possible.

Sincerely,
Gary L Westerlund

299

PRESTON
THORGRIMSON
SHIDLER
GATES & ELLIS
ATTORNEYS AT LAW

5000 Columbia Center
701 Fifth Avenue
Seattle, WA 98104-7078

Telephone: (206) 623-7580
Facsimile: (206) 623-7022

November 3, 1993

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Dr. Brian D. Winter
Team Leader
Elwha Restoration Interagency Team, Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362-6757

Draft Report on Restoration of the Elwha River

Dear Dr. Winter:

On behalf of Rainier Evergreen, Inc., I am writing to comment formally on the September 1993 public review draft of *The Elwha Report* (the "Report"), which was called for by the Elwha River Ecosystem and Fisheries Restoration Act, P.L. 102-495 (the "Act"). Rainier Evergreen wishes to comment because it owns a significantly large piece of property along the Elwha River that will be dramatically affected by decisions about dam removal.

The Report represents an important effort to gather information and to grapple with the issues raised by the Act. Rainier Evergreen wholeheartedly supports preserving the outstanding ecological qualities of the Elwha River basin, and wants to work with others in the area to preserve the ecosystem. Its concerns center on several issues:

- the delays in Rainier Evergreen's ability to make any economic use of its property. These delays have already occurred and will continue to occur if the recommendations of the draft Report are made final and are acted upon.
- the impacts upon downstream property of the flooding and sedimentation that will attend dam removal.
- the Report's vagueness on ultimate restoration and management of the river corridor.

Because these concerns are raised by the Act as well as by the Report, and because Congress may consider appropriations and other legislation to carry out the Report's recommendations, Rainier Evergreen has also written to the Washington congressional delegation.

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A Partnership Including A Professional Corporation

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NOV 4 RECD

Background

Before detailing Rainier Evergreen's concerns, I will provide additional information about its perspective. In 1977, Rainier Evergreen acquired a 140-acre parcel on the west and east banks of the Elwha a little less than 5 miles from the mouth of the river. The land controls a total of about 6000 feet of Elwha River frontage. It is a beautiful piece of property, scenic and serene. It provides a natural setting for a wide variety of recreational experiences involving fish and wildlife. It combines unique "no bank" waterfront, where the elevation of the property is barely higher than the river, with high bank waterfront that provides sweeping vista views from high bluffs of Elwha Bluff Canyon and the Olympic Mountains. In the middle of the river along the property is a small island that is ideal for monitoring the status of various species of fish in the river.

The property is strategically located for purposes of the Act. Because it offers one of the few easily accessible properties along the Elwha with prime, pristine no-bank waterfront, Rainier Evergreen has given the Washington Department of Fisheries unrestricted access, which they frequently use. It also borders the properties with sites for major wells supplying the City of Port Angeles, the Dry Creek Water Association, ITT Rayonier, and Daishowa. The State has a fish hatchery just downstream from the property.

Due to the uncertainty surrounding restoration and the effects of dam removal, Rainier Evergreen has been completely stymied in its efforts to develop the property, although it is zoned residential and Rainier Evergreen has investigated a number of potential uses. Rainier Evergreen is seriously considering three options that would help preserve and feature the ecosystem by leaving much of the property in its natural state. These are a destination resort, year-round housing using the approach of a planned unit development, and a year-round recreational vehicle park. But before Rainier Evergreen can do anything with the property, it has to have water. No public water supply serves the area. The property has one well, which serves a caretaker's home. This well is inadequate to serve larger development, but it is important to allow even minimal use of the property and should be protected against the effects of dam removal.

If Rainier Evergreen could install a well, water would be no problem. A professional geohydrologist has found plentiful water at a proposed well site near the river. A copy of his report is attached for your reference. More than three years ago, a permit application was filed with the Washington Department of Ecology for a well capable of producing 800 gallons per minute. This well could serve both Rainier Evergreen's property and a large region west of the Elwha where lack of a public water supply has thwarted development of over 4500 acres zoned for residential use. No one has formally protested the Rainier Evergreen application, but the Lower Elwha S'Klallam Tribe has expressed concerns about the availability of water. Ecology has not granted the application, and has informed Rainier Evergreen that it feels it cannot grant the application, if at all, until either the dams are removed, or a final decision is made that they will not be removed. Thus, Rainier Evergreen is completely unable to develop the property. At the same time, City of Port Angeles, Dry Creek Water Association and other wells located on sites

immediately adjacent to Rainier Evergreen's property continue to be used because those wells were dug prior to the Act.

Moreover, the possibility of dam removal poses a direct threat to the property. The draft Report notes that dam removal may lead to increased flooding. This would result partly from the loss of storage provided by the dams and partly from sedimentation. Increased sedimentation could also cause the river to change its course. Flooding and sedimentation are of particuler concern because of the no-bank frontage.

Rainier Evergreen cannot now put the property to its highest and best use. The lack of water and the potential for havoc from flooding and sedimentation associated with dam removal will discourage any sensible plan for development.

Specific Concerns

Delays. Rainier Evergreen has been waiting for years to develop its property and there is no end in sight. The draft Report does not even call for an EIS to be begun until about a year from now. If the dams are removed on the fastest possible track, which appears to be the timetable called for by the Report, water quality protection activities are not even projected to be complete until September 1999, and major dam removal and sediment management activities will not be done until March 2002. Thus, at the *earliest*, it will be about 10 years from now before Rainier Evergreen knows how its property stands if restoration is pursued. As a practical matter, it could take much longer as Congress debates whether and at what levels to fund dam removal, and as unforeseen circumstances lead to the preparation of as yet unanticipated studies and other time-consuming tangents. The Report accurately notes that there is a high level of uncertainty as to the results of various dam removal activities. Unexpected results can often lead to delays.

Flooding and Sedimentation. In the "Definite Plan for Dam Removal," the Report lists increased flood potential and water quality mitigation as liabilities associated with dam removal. Vol. 1, p. 64. This is true regardless of the type of approach to sediment management. Even with the "removal" approach to sediments management, the most expensive alternative, "Drawdown and construction could cause large quantities of suspended sediment to be washed downriver." Vol. 1, p. 75. With the "retention" approach, sediments may not remain in place because channel meander and flood events would likely erode the material. Vol. 1., p. 79.

Particularly with the "erosion" approach, the effects of flooding and sedimentation on riparian property may be severe.

> [T]he quantities of material now trapped in the reservoirs could cause localized flooding, changes in river course, and increases in river bed elevation.

> The ability to predict and control the effects of material moving through the river system is poor.
>
> Impacts to river morphology could cause localized flooding. (Vol. 1, p. 76.)

Rainier Evergreen's geohydrologist agrees that the effects may be severe. He has stated that the riverbank frontage may be wiped out by dam removal and that the caretaker's well may be adversely affected by sedimentation. Yet the Report does not address these effects in any detail. The Report calls for no restoration of or compensation for Rainier Evergreen's property, which lies below the Elwha Dam. Vol. 2, p. 154. The caretaker's well may be one of the "miscellaneous wells" mentioned by the Report, but the Report calls only for identification and study of such wells, not for any protection or compensation. Vol. 1, p. 93.

101

In contrast, the Report provides in detail for protection of the Tribe's property (including costs associated with a levee), and for protection of the water supplies of large users. Vol. 1, pp. 94-96. We recognize that the Act does not expressly require protecting Rainier Evergreen's property rights. However, as a matter of equity and due process, they too should be protected. The desire of the Tribe and others to return the Elwha to its pre-dam state is understandable. But the cataclysmic effects of dam removal may not accomplish that objective. And it seems unfair and poor public policy to pursue that objective at the expense of Rainier Evergreen while major stakeholders, such as the Tribe, Daishowa, ITT Rayonier, the City of Port Angeles and the Dry Creek Water Association, are made whole.

Restoration Measures and Management. The draft Report contains insufficient detail about proposals for restoring and managing the river corridor. A few references are made to a trail from the mouth of the river to the dams, but it is unclear whether this would traverse Rainier Evergreen's property. *See* Vol. 1, p. 42; Vol. 2, pp. 178-182.

Similarly, there are several references to management of the river corridor. For example, the Report states that the Tribe supports management of the "central river corridor" to protect fish and wildlife, and that "the Tribe is willing to explore the possibility of a cooperative venture to restore and manage the river corridor[.]" Vol. 1, pp. 114-15. The Tribe proposes transferring "Project Lands" in trust to the Tribe. Vol. 2, Appendix I, especially pp. 103-104. Technically, Rainier Evergreen's property does not fall within Project Lands as defined by the Act. However, the property is strategically located along the river corridor, as discussed above. It is unclear whether Rainier Evergreen's property is intended to be part of "corridor" referenced by the Report, and there is no indication of what the proposed management would involve or how it might further limit use of the property. Nevertheless, Rainier Evergreen is willing to explore the possibility of converting its property to park or other public use for adequate compensation.

Conclusion

In sum, the final Report should provide further detail on speeding the process, on avoiding further delays, on protecting riparian property owners from, or compensating Rainier Evergreen for, flooding and sedimentation, and on the hiking trail and corridor management proposals that directly affect Rainier Evergreen's property.

Thank you very much for your consideration of Rainier Evergreen's views. Please contact me if you would like further information.

Very truly yours,

PRESTON THORGRIMSON SHIDLER
GATES & ELLIS

By Eliz Thomas
Elizabeth Thomas

ET:lg
enclosure
cc: Rainier Evergreen, Inc.
John Segerson
Tim Peckinpaugh

301

RECEIVED
MAILROOM
93 OCT 19 AM 11:09
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Nicole Seinfeld
516 No. "C" St.
Tacoma WA 98403
206/383-0064

14 October 1993

Bruce Babbitt
Secretary of Interior
c/o Olympic National Park
600 E Park AVE
Port Angeles WA 98362

Dear Secretary Babbitt:

The removal of the Elwha and Glines Canyon dams on the Elwha River in Western Washington is a timely and important step that I urge you to take.

I agree with your determination that removal of the dams is necessary to restore the ecosystem, including its anadromous fish populations. Please move forward quickly, submit the final report, and approve the restoration project! The fish cannot wait any longer, many runs are quickly going extinct.

Make sure that sufficient funds for the dam removal and river restoration are included in the Interior Department budget. The Elwha deserves high priority. Dam removal is a revolutionary measure which sends an important message to our citizens. We do care about our environment, and we recognize the importance of a healthy environment to our economy.

I also urge you to develop a definite action plan and timeline for the removal of the two Elwha River dams. The time is ripe, people are ready, you must act now to complete the restoration process!

Sincerely,

Nicole Seinfeld

Nicole C. Seinfeld

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MAILROOM
93 OCT 19 AM 11:10
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 15, 1993

The Honorable Bruce Babbit
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbit:

I am writing to express my appreciation for your strong support of the Restoration of the Elwha River Ecosystem. Having grown up hiking and boating on the Elwha River, I concur with your stance that we must remove the dams blocking fish migration on the river. This represents an opportunity for balancing our destructive past with ecosystem needs.

Please move swiftly to implement the Elwha River Restoration plan. The natural fisheries will only decline further if we wait any longer.

I would like to see the Elwha project placed highly on the Interior Department budget. Funds needed for dam removal and river restoration should be included in Administration appropriation budgets.

Please provide leadership by developing a definitive plan of action an specific timetable for removal of the Elwha and Glines Canyon dams.

Thank you for your concern for the Elwha River ecosystem.

Sincerely,

David Overton
3327 28th SE
Olympia, WA 98501

16th October 93

6201 15th AVE NW
Seattle, WA 98107

Thanks for the strong report on the restoration of the ELWHA river ecosystem

Let's remove the dams (completely)

Yours Sincerely

Graham Cooper

303

1428 36th Ave.
Seattle, WA 98122
October 15, 1993

RECEIVED
MAILROOM
93 OCT 19 AM 11: 11
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Hon. Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Secretary Babbitt,

Thank you for your efforts toward restoring the Elwha River Ecostystem. I agree with your position that removal of the dams is the best chance at saving the salmon runs in the area. I urge your to make the Elwha a high priority in the Interior Department budget. Please include the funds needed for river restoration and dam removal in upcoming appropriation requests.

Thankyou,

Michael Lippman MD

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OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

303

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October 18, 1993

Dear Honorable Bruce Babbitt,

Thanks for your efforts in creating the report ~~about~~ Restoring the Elwha River Ecosystem. I agree that we must remove the dams blocking the Elwha River, and in doing so restore an invaluable ecosystem.

Pls work swiftly to implement the restoration plan.

Since this is a high priority project, pls include money in the Interior Dept's budget as well as in upcoming Administration appropriation requests.

Finally, pls develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Sincerely,

MARK A JOHNSON
5648 248th PL SE
Issaquah WA 98027

RECEIVED
MAILROOM
93 OCT 19 AM 11: 16

October 17, 1993
[illegible] 14th Ave. W.
Seattle, WA 98119

Secretary Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

The Honorable Bruce Babbitt:

I am contacting your office to express my support for the removal of the Elwa Dams. I thank you for your efforts and the strong report on the Restoration of the Elwa River Ecosystem. I to belive that removal of the dams presents a great opportunity for restoring an invaluable ecosystem.

I encourage swift implementation of the restoration plan. Please make the Elwa a high priority and include funds for restoration in the upcoming Administration appropriation requests. Finally, develop a definite action plan and timeline for the removal of the Elwa and Glines Canyon dams.

Sincerely,

Mike A. Wessels

Mike A. Wessels

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93 OCT 19 AM 11:14

OLYMPIC [illegible] PARK
PORT [illegible] WA 98362

1709 19th Avenue Court
Milton, Washington 98354
October 18, 1993

The Honorable Bruce Babbitt
C/O Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362

Dear Mr. Babbitt:

I was pleased to learn that the Interior Department is supporting the removal of the two Elwha dams and restoration of the free flowing river system. I have enjoyed backpacking this area for many years and look forward to the time when the river will once again flow without interruption and the salmon runs return. I urge the Interior Department to make this restoration process an urgent priority for funding. Thank you for your continued support of environmental matters.

Very truly yours,

Colleen L. Campbell

Colleen L. Campbell

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93 OCT 19 AM 11:14

OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

10-18-93

Dear Secretary Babbit,

Thanks for the strong report on the Restoration of the Elwha River Ecosystem! I concur; the dams must come down. This presents a great opportunity for restoring a valuable ecosystem. Please set a budget that can move forward quickly

Yours truly,

Diane Huey

Diane Huey
1950 15 Ave East
Seattle WA 98112

10-16-93

RECEIVED
MAILROOM
93 OCT 19 AM 11: 14
PORT ANGELES, WA 98362

Dear Secretary Babbitt

Thank you so much for your leadership and strong report on Restoration of the Elwha River Ecosystem. I agree, we must remove the dams.

Please make the Elwha a high priority in the Interior Department budget. Please include funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

We hope this environmental precedent can take place very soon.

Thank you

306

Sincerely

P— L. Siggs

Pat Siggs
1950 15 Ave East
Seattle WA 98112

[illegible] AVENUE
SEATTLE WASHINGTON [illegible]

October 17, 1993

RECEIVED
MAILROOM
93 OCT 19 AM 11: 15
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Secretary Babbitt,

Since coming to the pacific northwest nearly 40 years ago I have been dismayed by the progressive deterioration of the anadromous fish runs. Although there are many contributing factors, the value of removing dams has, until now, not been able to be studied. I have recently listened to presentations by fisheries biologists outlining approaches to the removal of the Elwha dams and presenting their encouraging scenarios of potential restoration of the salmonid runs.

Your strong report supporting the dam removal program and the ecosystem restoration is gratifying and hopefully will merit a high budget priority in the Department of Interior.

Sincerely.

Francis C Wood, Jr. M.D.

306

[illegible]

SEATTLE WA

PM

USA 19

RECEIVED
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93 OCT 19 AM 11:05

OLY[illegible] PARK
FOR[illegible] WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

October 13, 1993

Dear Mr. Babbitt,

Thank you for supporting restoration of the Elwha River ecosystem. I agree that removal of the dams is a unique opportunity for restoring native fisheries. Now is the time to implement the Elwha River Restoration plan. I hope you will make this a priority in the Interior Department and include funds for its implementation in the department's appropriation requests.

Sincerely,

de Groot
2147 Lakemoor Dr.
Olympia WA 98512

RECEIVED
MAILROOM
93 OCT 19 AM 11:04
OLYMPIC
PORT ANGELES

USA 19

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt Oct. 16, 1993

We wish to congratulate you on your strong report on the Restoration of the Elwha River Ecosystem. Please move quickly to implement the plan by removing the dams and restoring the ecosystem. The salmon cannot wait much longer. Please include the needed funds in upcoming appropriations requests. This is is a wonderful opportunity to restore a valuable ecosystem and it would be tragic to let such an opportunity pass by. We are watching and waiting for the outcome on this matter.

Sincerely,
Greta de Groot
Greta and Ray de Groot
Ray de Groot

P.S. Please respond
& keep us informed on
further developments

DEAR INTERIOR SECRETARY BABBITT:

THANK YOU FOR THE STRONG SUPPORT ON THE RESTORATION OF OF THE ELWHA RIVER ECOSYSTEM. I AGREE WITH YOU THAT WE MUST REMOVE THE DAMS BLOCKING THE ELWHA RIVER, AND THAT THIS PRESENTS A GREAT OPPORTUNITY FOR RESTORING A INVALUABLE ECOSYSTEM.

I ALSO HOPE THAT THIS CAN BE DONE AS QUICKLY AS POSSIBLE. I'M SURE THAT YOU ARE AS FRUSTRATED AS THE AVERAGE AMERICAN CITIZEN BY THE SOMETIMES LACK OF SPEED THAT OUR GOVERNMENT SHOWS IN ACTING ON PROJECTS SUCH AS THIS. HOWEVER I AM IMPRESSED BY THE SPEED WITH WHICH YOU HAVE ACTED ON SEVERAL CRUCIAL ENVIRONMENTAL ISSUES. I HOPE THAT YOU ARE EQUALLY SUCCESSFUL INFLUENCING THE SPEED WITH WHICH THIS PROJECT IS COMPLETED. THANK YOU.

BRADLEY T. NOBLE
611 S. WASHINGTON
PORT ANGELES, WA
98362

RECEIVED
MAILROOM
93 OCT 20 AM 10:33
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

ELLIOTT S. TREMAINE

RECEIVED
MAILROOM
93 OCT 20 AM 10:33
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 19th, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA   98362

Dear Secretary Babbitt,

What a marvelous opportunity!

The chance to return the Elwha to it's original undamned self.

And this effort being the first time major dams are removed from a river that formerly had a major spawning Salmon population with luck may produce major runs again.

I believe the Salmon will return, please do your best to fund the dam removal at the earliest possible date.

Sincerely,

Elliott S. Tremaine

ELLIOTT S. TREMAINE
11046 EXETER N.E.
SEATTLE, WASHINGTON 98125

309

Sue Olson
[illegible] 33rd Avenue W
Seattle, Washington 98199
October 19, 1993

RECEIVED
MAILROOM
93 OCT 20 AM 11:34
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, Washington 98362

Dear Mr. Babbitt,

Thank you for your support for removal of the dams blocking the Elwha River. I agree with you that we must restore the Elwha River ecosystem and that removing the dams is a necessary first step. Please continue to work to implement this action by making the Elwha a high priority in the Interior Department budget. Funds for dam removal and river restoration must be included in the upcoming Administration appropriation requests.

In addition to funds a definite action plan and timeline for removal of the Elwha and Glines Canyon dams must be developed.

Thank you

Sincerely,

Sue Olson
Sue Olson

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OLYMP[illegible]
PORT ANG[illegible]

COPY

M. Yenney

520 West 3rd Street
Port Angeles, WA 98362
November 8, 1993

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
National Marine Fisheries Service
7600 Sand Point Way N.E.
Seattle, WA 98115

Dear Brian:

Re: The Elwha Report, Section,
Disposition of Elwha Project Lands

The section, *"Disposition of Elwha Project Lands,"* does not mention or provide access to these lands for the general public. In Section 4, *"Development and Use by the State,"* it is noted that no state agency is interested in the management of these lands.

There was a meeting to provide input on the disposition of the project lands in the Clallam Courthouse on April 14, 1993. The attendance was limited to government agencies, two large industries, and a few land owners. The general public was not aware of this meeting. It was stated in this meeting, *"there would be a public hearing on the disposition of the project lands at a later date."* At this date, there has not been a public hearing on the disposition of the project lands. I trust that the general public will be given the opportunity to receive the same information that was provided in the meeting on April 14, 1993.

The general public will be asked to financially support the acquisition of the two projects and removal of the two dams. This is an extremely large sum of money that we will have to pay. It is, therefore, reasonable that we be given the opportunity to have access to these project properties.

Presently the Elwha Project Lands are accessible to the general public. This access may be difficult, but the lands are accessible. It is requested that this access be maintained and improved in the final copy of the Elwha Report.

310

The final copy of the Elwha Report needs to provide a legal easement for an Elwha public trail with a minimum width of 12 feet adjacent to or in close proximity to the Elwha River channel starting at the present Elwha Dam site and up to the McDonald Bridge crossing. This legal easement would provide for a minimum of five access points to the Elwha public trail.

The Olympic National Park in the future management of the Glines Project Lands has done an outstanding job in providing access for the general public. See pages 172 through 175. They have provided descriptions of proposed public trails and campgrounds while meeting the criteria for an environmentally-sensitive area. It is requested that the legal easement for the Elwha public trail in the final copy of the Elwha Report be given this same level of management planning.

Your cooperation on this request is sincerely appreciated.

Sincerely,

J. Michalczik

J. Michalczik

JM:AW

cc: M. Finnerity
C. Hoffman

311

311

April J Caron
1001 Taylor Ave N #102
Seattle WA 98109

RECEIVED
MAILROOM

93 OCT 20 AM 11: 34

OLYMP[illegible] PARK
PORT [illegible] WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles WA 98362

Dear Sir

Thank You for the strong report on the Restoration of the Elwha River Ecosystem ! I believe that we must remove the dams blocking the Elwha River. the opportunity to try to restore this ecosystem to its original state is an unprecedented opportunity

Please make restoring the Elwha a top priority in the Interior Department budget. the longer we wait more native fish will be lost making restoration more difficult

Sincerely

April J Caron

RECEIVED
MAILROOM
93 OCT 20 AM 11: 35
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, Washington 98362

Carrie Saxifrage
512 N. 68th Street
Seattle, Washington 98103

October 18, 1993

Dear Secretary Babbitt,

I am a Washington resident who has spent much time backpacking in the Olympic National Park. I have grown to love and respect its wildness.

I strongly support removal of the Glines Canyon and Elwha dams on the Olympic Peninsula. As your report regarding the dams showed, dam removal is the only hope for returning the legendary Elwha salmon runs to their former grandeur. Fostering the natural resources of the Olympic Peninsula, such as the Elwha salmon runs and the wildlife which they in turn support, will result in long term economic sustainability for an area whose greatest asset is its unique natural splendor.

Please apply the necessary pressure to the appropriations process to assure that dam removal will be adequately funded by Congress. When the dams come down, a dream that many have had and worked for over very many years will be finally fulfilled. I urge you to carry out your role with all due urgency and enthusiasm.

Very Truly Yours,

Carrie Saxifrage
Carrie Saxifrage

312

RECEIVED
MAILROOM
93 OCT 20 AM 11: 35
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

James Keithly
5527 64th St SE
Snohomish, WA 98290

October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt,

You have my personal gratitude and thanks for developing plans to restore the Elwha Rivers system. Opportunities such as this are unheard of and I believe this could be an opportunity to set a precedent and example for others to follow. I would like to urge you to move ahead rapidly with the a plan to remove the dams blocking the Elwha. A plan of action and timetable need to be developed as rapidly as possible for this project.

I realize that budgets are shrinking, but the Elwha needs to be a high priority for the Department of Interior. If funds are not allocated this project could be placed on the backburner. Please include the funds needed for dam removal and river restoration in upcoming appropriations requests.

The case for restoration of the Elwha is compelling and your concern and dedication to this project is remarkable. You do not know how encouraging projects like this are to people concerned with native fisheries and river ecosystems.

Best Regards,

James Keithly
James Keithly

312

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93 OCT 20 AM 11: 35
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

9610 7th Ave NE
Seattle, WA 98115
October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt,

I am writing to thank you for your recommendation that the "removal of both the Elwha and Glines Canyon dams is necessary to fully restore the ecosystem and native anadromous fisheries."

I agree with you completely that there is an "extraordinarily compelling" case for removing these two dams, and that the Elwha River presents "an enormous opportunity" for ecosystem restoration.

I hope we can both look forward to swift action to implement this plan and restore the Elwha!

Sincerely,

L.A. Heberlein

RECEIVED
MAILROOM
93 OCT 20 AM 11: 35
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Monday, October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Secretary,

Thanks for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan. The dams are blocking over 75 miles of pristine spawning habitat within Olympic National Park.

Bring back the fish now! Include Elwha restoration funds in the upcoming budget.

Sincerely,

Thomas Schram

Alicia Kramer

ESI Systems
MACINTOSH CONSULTANTS

Thomas Schram
Creative Director

1916 Pike Place #12-1245
Seattle, WA 98101

(206) 329-5838
FAX (206) 322-6738

RECEIVED
MAILROOM
93 OCT 20 AM 11: 36
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

P.O Box # 1
Okanogan, Wa.
98840
10-16-93

Bruce Babbitt
Sec. of Interior:

Please remove the Elwha dam as soon as possible. The longer the delay the worse it gets for the fish. Make this a high priority.

Sincerely,

October 19, 1993

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MAILROOM
93 OCT 20 AM 11: 36
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

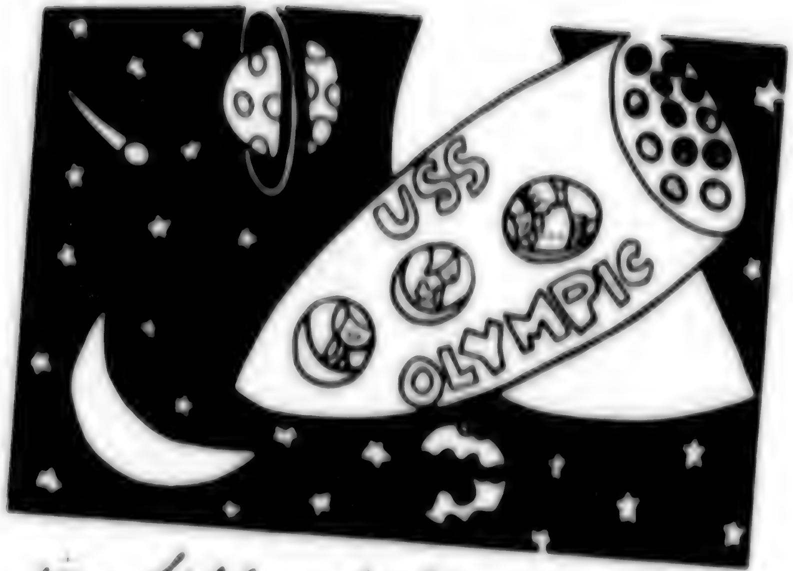
Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Sir:

Please add my support to Restoration of The Elwha River System by removal of all dams and any other obstructions That impede Salmon Runs.

Bernard F. Dixon

[redacted]



Dear Secretary Babbitt,

93 OCT 20 AM 10:30

Please help us remove the dams on the Elway River Ecosystem. Rivers must be viewed as ecosystems - and this is one place where there is no need for continued dams.

Please make the removal of the dams a high priority project for the Dept. of the Interior.

We will support you in fighting for these funds in Congress.

The sooner the better for our precious runs of pink salmon!

Thank you
Denise and Don Hamly

3302 S. Wash. St.
Seattle, Wa. 98144

10589 14th Ave SW
Seattle, WA 98146
October 16, 1993

RECEIVED
MAIL ROOM
93 OCT 20 AM 11:46

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Secretary Babbitt

Thank you for your recent report on Restoration of the Elwha River Ecosystem. I am very glad you see the great need to remove the Elwha and Glines Canyon dams. With so many salmon and other fish species decimated, removal of these dams is truly urgent.

The Elwha should be a high budget priority. Please request Congress to appropriate money to remove these dams and restore the Elwha River. Please develop an action plan and timeline for removing these two dams.

With so much environmental degradation occurring in our country, here is a chance to do something positive. We can easily restore salmon runs and a great river ecosystem — sounds like a bargain to me. Lets act promptly to remove the Elwha and Glines Canyon Dams.

Sincerely yours,
David Harrowe
David Harrowe

10-19-93

Dear Secretary Babbitt,

The Elwha River is in one of my favorite parts of the Olympics, so I was very excited to hear that there was a possibility that the dams on the river might be removed. It seems like at least once a week there's an article in the newspaper about salmon runs dying out in some river or another. This would be an excellent opportunity to reverse that trend. I don't know how much that part of Washington needs the hydroelectric power the dams generate, but I would think restoring the fish runs would be a good idea both economically and recreationally.

I hope you will do everything you can to make getting money for removing the dams a very high priority in your budget and that you ~~would~~ and your staff will work toward getting the project approved in Congress.

Sincerely,
Dave Langford
214 Martin St.
Steilacoom, WA
98388

cc: Sens. Gorton and Murray
President Clinton

RECEIVED
MAILROOM
93 OCT 20 AM 11:46
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Rhonda Fleischer
13231 1st Ave. NW
Seattle, WA 98177
October 18, 1993

Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362-6757

Dear Mr. Winter:

I am writing in regard to the Elwha dam, after learning of the recent Interior Department report. I recognize the expense involved in tearing down the dam all together, however, in the long run we will create an even greater expense by destroying our natural resources. I'm sure you are aware of the critical state of the Northwest salmon, and given the importance the Elwha River has had in the past for supporting our salmon, it is that much more important that we completely remove the dams and allow for a real solution to these problems. Fish passage structures will do little to truly address the situation at its core. When we shy away from tough decisions (like spending a substantial amount of money to tear down the dams), we create that many more complications and disturbances for the future of our resources and our own survival.

I urge you to relay my strong support for tearing down the Elwha dam to all those involved, and to please work towards this end.

Thank you

318

Sincerely

Rhonda Fleischer

Rhonda Fleischer

Dr. Brian Winter
Olympic National Park
600 East Park Ave
Port Angeles, WA 98362

Mr Winter

I am writing you in regard to the proposal of removing the dams on the Elwa River

As a resident of Port Angeles I don't think this project will effect my life any with the proposals in this study. Water quality was a concern but that is well taken care of in the proposal.

As a sport fisherman my mouth waters with the thoughts of someday being able to catch big fish right in my backyard.

My main concern is the cost of doing this project. When the country is in the financial state that it has gotten to. Someone has to wakeup and smell the coffee and say hey we can't afford to do this at this time. Not just this project but some of the other projects the government is financing.

I know that I have to keep on paying taxes , and it bothers me that the government acts as if they have a purse full of money. I cant run my home in this manner without getting in trouble, and I would like to think at sometime people in the government would realize that they have to quit spending money they don't have

Thank you

David H. Moody

DAVID & SHAREL MOODY
1808 W. 5TH
PORT ANGELES, WA. 98362

OCT 25 REC'D

318

RECEIVED
MAILROOM
93 OCT 20 AM 11:48
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 18, 1993

Secretary of Interior Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River and that this presents a great opportunity for restoring an invaluable ecosystem.

I urge you to do the following:

- Move swiftly to implement the Elwha River Restoration plan
- Make the Elwha a high priority in the Interior Dept. budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.
- Develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams

Thank you for your attention to this matter.

Sincerely,

Barbara Shulman

Barbara Shulman
2308 N. 55 Street
Seattle, WA 98103

20417 - 86th Pl W
Edmonds, WA 98026
October 18, 1993

RECEIVED
MAILROOM
93 OCT 20 AM 11:48
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 [illegible]e
Port Angeles, WA 98362

Dear Mr Secretary:

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

I urge you to implement the Elwha River Restoration plan as soon as possible and make the Elwha a high priority in the Interior Department budget. Salmon are a precious resource for us all.

Sincerely yours,
Susan Henderson

RECEIVED
MAIL ROOM
93 OCT 20 AM 11:33
OLYM... PARK
PORT...

411 West Prospect Street
Seattle WA 98109

October 18 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Sir

I am writing to express my appreciation for your support of the Restoration of the Elwah River Ecosystem. I entirely agree that we should remove the dams blocking the Elwah River. This is an invaluable opportunity for restoring a unique ecosystem.

I urge you to move swiftly to implement the Elwah River Restoration Plan. We can't wait any longer. Make this a high priority in the Interior Department Budget. Please include funds needed for dam removal and river restoration in the upcoming Administration appropriation requests. This will need a definite action plan with timelines for removal of the Elwah and Glines Canyon Dams.

Sincerely

J P Brown

Joseph P. Brown

JB/dc30

320

The Honorable Bruce Babbitt - 10 19 93

Please implement the Elwha River Restoration project & allocate monies to do this

This all needs to be done as swiftly as possible to provide for the future of salmon runs

Please set up definite timeline for Dam removal & river restoration

Thanks

Bob Gardner

Barbara A. Gardner
P. O. Box [illegible]
[illegible] WA [illegible]

RECEIVED
MAILROOM
93 OCT 20 AM 11:30
OLYM...
PORT...
...ARK
...8362

320

October 19, 1993

Dear Secretary Babbitt:

Thank you for supporting the removal of the Elwha and Glines Canyon dams blocking the Elwha River. This must be done as soon as possible lest the legendary fish runs on the Elwha River be lost forever.

Please therefore make it a high priority to see that money is appropriated for dam removal and restoration of the Elwha.

Sincerely,
Mary Pratt Bodman
Mary Pratt Bodman
5514 Kuhn St.
Port Townsend, WA 98368

Mary Pratt Bodm
5514 Kuhn St.
Port Townsend,

TACOMA WA 984
1993

RECEIVED
MAILROOM
93 OCT 20 AM 11:32
OLYMPIC NATIONAL PARK
PORT ANGELES WA 98

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

322

RECEIVED
MAILROOM
93 OCT 20 AM 11:32

USA 19

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave.
Port Angeles, WA
98362

Dear Mr Babbitt, I strongly urge you and the Clinton Administration to implement the Elwha River Restoration Plan. It's time to make the Elwha the number 1 priority in the Interior Dept Budget for Dam removal. Please notify us when a time frame has been developed for removal of the Elwha and Glines Canyon dams. I hope it will be before the next election. A tax paying voter

Robert Tr[illegible]
[illegible]
[illegible]

322

We support you in removing the dams of the Elwha to restore the salmon runs
Kathleen + Tom Kuker

93 OCT 20

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park
600 E. Park Ave
Port Angeles, WA
98362

Ms. Kathleen Kuker
19206 65th Pl. NE
Seattle, WA 98155

Recycled Paper

Rosemary Bridge
209-B Knapman Avenue
Sequim, WA 98382
(206) 683-5723

Oct 18, 1993

Secretary of the Interior Bruce Babbitt,

Sir,

Thank you for your support of the Elwha River restoration. As a resident of the Olympic Peninsula and a volunteer at Olympic National Park I have learned of the importance of this river to the anadromous fish.

I hope you can promote a definite plan for the removal of the Elwha and Glines Canyon Dams including funding and a time frame for the project.

Sincerely,

Rosemary B. Bridge

RECEIVED
10/20/93

324

RECEIVED
MAILROOM
93 OCT 20 AM 11: 32
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

USA 19

Wren Building College of William & Mary

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Sir:

We fully support the plan to remove the dams on the Elwha River, and hope that funds for Elwha restoration will receive high priority in the current budget.

Sincerely,
Mr. & Mrs. Walter D. Christie
2608 E Fir
Mount Vernon, WA 98273

324

The Honorable Bruce Babbitt 10/19/93
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Secretary Babbitt:

I understand that concrete steps are being taken to remove the dams on the Elwha River. This is the first solid step I have heard about to attempt to reverse the widespread disruption of our nation's ecosystems. I wholeheartedly support this action and urge you to use your powers to ensure that it proceeds in a timely fashion. As I am sure you are aware the 1993 salmon harvest was almost canceled on west coast(and maybe should have been)and only through restoring breeding grounds can this unbelievable action can be avoided.

Keep up the good work.

Sincerely,

Paul Lewis, MD
8206 Meridian Ave N
Seattle, WA 98103

OCT 21 RECD

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Re: Elwha River Restoration Project

Dear Secretary Babbitt:

I have watched with interest the efforts to remove the Elwha and Glines Canyon dams from the once wild and majestic Elwha River. Thank you for the strong report on the restoration of the Elwha. I agree with you that we must remove the dams, which have outlived their usefulness and have killed formerly abundant runs of wild salmon.

I write to urge you to move swiftly to implement the Elwha River restoration plan. The plan presents a great opportunity to restore a priceless natural resource. The Elwha has suffered enough.

Please make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming administration appropriation requests. Please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

The Northwest has borne enough of the burden of modern development. Our ancient forests have been decimated by greed and a shocking lack of foresight by the forest service and private logging interests. This wondrous section of our country needs and deserves swift action to remove the dams on the Elwha.

Thank you in advance for your consideration of this matter.

Sincerely,

Andrew P. Zinner
500 Union St., Suite 500
Seattle, WA 98103

OCT 21 RECD

OCT. 17, 93

Dear Bruce,

In the summer of 1992 I worked with the United States Fish and Wildlife Service (Olympia office) on the Environmental Impact Statement for the Elwha Restoration Act. During this work it became clear to me the utter necessity to restore the Elwha River back to its original condition. This can only be done with the removal of both the Glines Canyon and the Elwha dams.

This restoration effort is historic i.e., never have dams of this size been dismantled and never has there been a better chance to fully restore an ecosystem to its original prime.

Please support this restoration plan and press for the inclusion of funds to pay for this project in the upcoming appropriations requests.

Thank You
Zach D.

423 Edison SE
Olympia WA 98501

OCT 21 RECD

October 19, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt,

I applaud you for supporting initiatives to restore the once prolific anadromous fish runs of the Elwha River in Washington state. I encourage you to pursue efforts to remove both the Elwha and Glines Canyon dams, as authorized by the Elwha River Restoration Act.

I agree with the National Park Service, National Marine Fisheries Service, Fish and Wildlife Service, the Lower Elwha Klallam Indian Tribe, and many others who feel that previous plans to restore the Elwha without dam removal are insufficient and unacceptable.

I ask for your continued support of the restoration of the river. Clearly, these dams should not have been built in the first place. Had their true costs been considered, I doubt they would have been. Case in point --these dams have been improperly licensed (if at all) for decades.

Payback time is here. We have a responsibility, an obligation, to make restitution for those instances in which we have demonstrably compromised and short changed the natural environment, local economies, and indiginous cultures.

Again, thank you for your part in making the restoration of the Elwha River a high priority of the Department of the Interior.

Sincerely,

Jon Barrett

Jon Barrett
Steilacoom, Washington

OCT 21 RECD

1928 George Washington Way
Richland, WA 99352
October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Secretary

I am writing to express my support for restoration of the Elwha River. Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree that this represents an excellent opportunity for restoring a valuable ecosystem, and that the dams blocking the Elwha River must be removed.

Thus I urge you to:

327

- Move swiftly to implement the Elwha River Restoration Plan. The sooner this is done, the sooner the salmon will recover.
- Make the Elwha restoration a high priority in the Interior Department Budget, and include the funds needed for dam removal and river restoration in the next appropriation requests.
- Develop a definite action plan and timeline for removal of the Elwha and Glines Canyon dams.

Again, let me express my strong support for your stand on this issue.

Very truly yours,

Richard C. Easter

Richard C. Easter

OCT 21 REC'D

ROBERT C. FAINE, D.D.S.
2737 77th Avenue S.E.
Mercer Island, Washington 98040
232-5710

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Secretary:

You have long been a champion of our natural resources including the Pacific salmon. We need your help in removing the two Elwha dams in order to enhance the restoration of the nearly depleted salmon runs.

Please develop and expedite a plan for timely removal of these dams.

Sincerely,

Robert C. Faine, DDS

RCF:CKN

OCT 21 REC'D

327

Rene' Brown
P.O. Box 4027
South Colby, WA 98384

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

Please accept my gratitude for your strong support to remove the dams on the Elwha River here near the Olympic National Park in the State of Washington. The removal of these two dams is an absolutely superb idea. I am sure that you are aware of the diminished Salmon runs in the Pacific Northwest. I believe that everything possible should be done to restore these fish runs not only for the sake of our economy but for recreational purposes as well. Please do everything within your power to persuade Congress to immediately fund the removal of these two dams and to restore the land to its former condition.

Again, I very much appreciate your support and efforts in this regard.

Yours very truly,

Rene' Brown

Rene' Brown

OCT 21 RECD

Oct 24

To whom it may concern -

I think taking out Glines Canyon Dam will be a huge mistake. When we need electricity! It also is a lovely spot to visit! The Salmon are already gone! What do the big shots in Washington D.C. know about things out here. We lived next to the airport during the war when they we building it. The Brains we had come there didn't know their head from a hole in the ground. Didn't know an alder from a stick. We had to cut our trees down as they were a hazard to the planes. Crown Zellerbach had a high Powered line going thru the air Port and it is still there!

We have a debt to pay why spend millions taking the dams out it doesn't make sense! Pay our debt!

Norma B. Moffat
610 W Spruce
Sequim
WA

OCT 28 RECD

10313 Lakeshore Bl. N.E.
Seattle, WA 98125
19 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt:

I write to thank you most earnestly for your support of the concept of restoring the Elwha River ecosystem by removing the dams that block access of salmon to their original spawning grounds. Such restoration would be not only a move of great practical value for this region but it would also be a model and example for the nation as a whole.

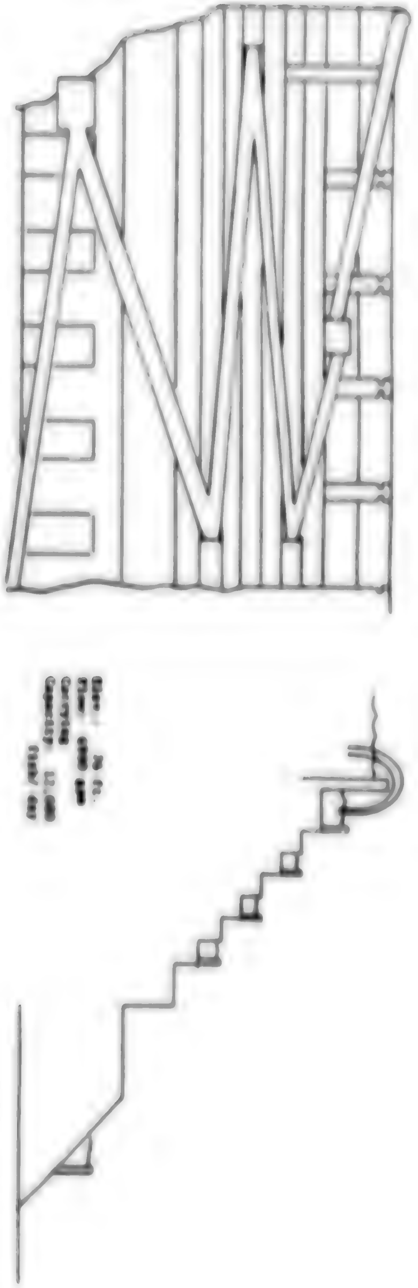
I urge you to give this action the greatest possible budgetary priority in forthcoming appropriation requests and in the formulation of specific plans for implementation.

Please accept my best wishes for your promising tenure in the Department of Interior.

Very truly yours,

Arnold Arons

Arnold Arons



PROPOSED FISH LADDER
FOR LOWER ELWHA DAM

OCT 21 REC

329

OUR SAVIOR LUTHERAN CHURCH
4519 - 112th Street East • Tacoma, Washington 98446 • (206) 531-2112

Oct. 19, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Babbitt,

For many years I have believed that retaining the dams on the Elwa River was a major stupidity. I am extremely pleased that you are acting to remove these dams. The Elwa salmon are some of the most magnificent anywhere in the world. We can't afford to lose this species.

Thank you again for working on this problem.

Yours,

Daryl Wildermuth

330

OCT 21 RECD

Daryl C. Wildermuth, Pastor
Arthur R. [illegible], M.C.E., Pastoral Assistant
Charles E. [illegible], M.C.E., Child & Youth
Jo Anne [illegible], Director of Parish Ministries

Richard Stocking
608 Sidney Avenue
Port Orchard, WA 98366

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

Thank you for your strong and continued support of the Elwha River Restoration Act. I agree that everything within our power must be done to remove the two dams which are now blocking the magnificent Elwha River.

In this State, everyone knows that it is important to do everything conceivable to restore our Salmon runs. The growing population is also demanding an end to ecological degradation. These two dams represent a most abhorable example of ecological degradation. Please see what you can do to obtain funding and to develop a suitable action plan for removal of these two dams.

Thank you very much for your efforts and for your thoughtful support.

Yours very truly,

Richard R. Stocking

OCT 21 RECD

330

October 19 1993
64 S Eldridge
Sequim WA 98382

Secretary Bruce Babbitt
C/O Olympic National Park
600 E Park Ave
Port Angeles WA 98362

Dear Mr Babbitt

Thanks for your support of the plan to remove the Elwha Dams

The fishing industry has had to carry the burden of poor logging practices poor oil shipping practices and poor electricity consumption Removing the dams will lift some of this burden off the fishing industry

I urge you to develop a plan of action and a schedule to remove these dams

331

Sincerely
Dave
David Le Roux

OCT 21 RECD

October 18, 1993

Secretary of Interior Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Honorable Mr. Babbitt

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River and that this presents a great opportunity for restoring an invaluable ecosystem.

I urge you to move swiftly to implement the final Elwha River Restoration plan and to include as a high priority in the Interior Dept. budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Thank you for your attention to this matter.

Sincerely,

Bill Rogers
2308 N. 55 Street
Seattle, WA 98103

OCT 21 RECD

331

4101-36th Ave. NE
Seattle, WA 98105
Oct 18, 1993

Dear Secretary Babbitt:

I want to go on record that the dams on the Elwha River should be removed. It is imperative that the ecosystems of this river be restored and only by the removal of the two dams can this be accomplished.

The decrease of the salmon runs in all of Washington's rivers is shocking and the Elwha River restoration is a fine place to start a rebirth.

Sincerely
Barbara C. Peterson

OCT 21 RECD

NANCY A. ENGEL

Oct. 19, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Secretary Babbitt:

Thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River or face certain loss of these fish runs. Removing these dams is a great opportunity for restoring an invaluable ecosystem.

I urge you to move swiftly to implement the Elwha River Restoration plan. The fish can not wait any longer! Make the Elwha a high priority in the Interior Department budget and include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Please make sure your department has developed a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Respectfully,
Nancy A Engel
3600 Whitman Ave. N #102
Seattle, WA 98103

OCT 21 RECD

October 20 - 1993

The Hon. Bruce Babbitt
c/o Olympic National Park
600 - E Park Avenue
Port Angeles WA 98362

Dear Mr. Babbitt -

At age 78 of a non-fisher woman, the removal of the Elwha dams could be of great interest, but not so. I strongly support your efforts to have the dam removal, do what you can to remove them quickly.

[illegible] you,
Dorothy E. Douglas

Ms Dorothy E. Douglas
[illegible]
[illegible]

OCT 21 REC'D

DEAR MR WINTER, OCT 13, 1993

I WRITE IN SUPPORT OF THE INTERIOR DEPARTMENT CONCLUSIONS THAT THE ELWHA AND GLINES CANYON DAMS MUST BE DISMANTLED TO RESTORE THE VALUABLE SALMON AND STEELHEAD RUNS. JUST MODIFYING THE STRUCTURES FOR FISH PASSAGE WOULD BE INADEQUATE

IN JULY 1960, MY GRANDFATHER BILL BLAKEY CAUGHT A 68 lb KING SALMON AT THE MOUTH OF THE ELWHA. HIS REMAINS THE RECORD FOR THE AREA, THROUGH HIS EYES I WATCHED THE SALMON AVAILABILITY DROP DRAMATICALLY. IN HONOR OF MY GRANDFATHER I REQUEST THAT THE DAMS BE REMOVED. WE MUST LEAVE SOMETHING OF VALL[illegible] FOR FUTURE GENERATIONS.

SINCERELY

Carole M. Blakey CAROLE M. BLAKEY

OCT 21 RECD

[redacted] Bruce, 9

I totally support the removal of the Dam(s), and the restoration of the Elwha and its ecosystem. I appreciate your efforts as well as everyone else's. I'm sure the fish will appreciate them as well..

OCT 21 RECD

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PAGE

Dear Mr. Babbitt

I'm writing you to urge your continued work toward the restoration of the Elwha River ecosystem. Please know that many Washington folk are behind the idea of removing both dams on the Elwha and want their removal to be a top environmental priority immediately. Thank you, Grace Brinkerman

Grace Brinkerman
6391 Fillmore Rd,
NE, [illegible]
[illegible]

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave,
Port Angeles, WA 98362

OCT 11 R

Dear Bruce

This [illegible] opportunity [illegible] the gates [illegible] the many [illegible] species of salmonids [illegible] I urge [illegible] planning [illegible] that will arrive [illegible] ultimately, at the Elwha dams. [illegible] will be [illegible] for the [illegible] of life, as well as a [illegible] to [illegible] composing [illegible] animals. [illegible] should be [illegible]

[illegible] dam in Elwha [illegible]

Sincerely

OCT 11 [illegible]

336

Mrs. James T. Berry
521 E. Chestnut Street
Walla Walla, WA 99362-1321

October 20, 1993

The Honorable Bruce Babbitt
c Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt:

This is to thank you for your strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and this presents a great opportunity for restoring an invaluable ecosystem.

In connection with this, several things seem necessary:

1. The fish can't wait any longer. Please move swiftly.

2. Money. Make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

3. Develop goals: a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

It's great to have a Secretary of the Interior who takes his responsibilities seriously. Keep up the good work.

Very sincerely,

Martha [illegible] Berry

Brian Winter
c/o Olympic National Park
600 E. Park Ave.
Port angeles, Wa. 9836

Dear Sir,

I have read the Elwha Report and attended the meeting at the Port Angeles High School on October 18, 1993. I was very pleased with the report and agree with most of the comments therein. I urge you to keep in mind that time is of the essence with this projet and we need to do everything possible to move things along as expeditiously as possible to insure a complete recovery. It is apparent from all the facts available that both dams must be removed for a complete restoration of the Elwha habitat. I believe that anything short of full restoration would be an insult to future generations. It is my sincere hope that everyone involved will do whatever it takes to make sure this project is completed quickly and completely.

Sincerely,

James D. Curnew

336

The Honorable Bruce Babbitt   October 20 1993
Secretary of Interior
c/o Olympic National Park
600 E Park Avenue
Port Angeles WA 98362

Dear Mr Babbitt:

I really do appreciate your support of the removal of the Elwha River dams and for the Restoration of the Elwha River Ecosystem.

Please, Mr Babbitt do see that this plan is actualized quickly and also please include the [illegible] request for removal of the dams and river restoration in the administration appropriation requests which will be coming up soon.

Also, please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

How wonderful it will be to see the salmon and steelhead returning to the river again. Thank you very much.

Very truly yours,
Elizabeth Berger

Elizabeth Berger
9526 Lake Wash. Blvd. N.E.
Bellevue, WA 98004 1607

OCT 22 REC'D

October 21, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

I am writing to strongly support the restoration of the Elwha River system, which must include the removal of the dams blocking the river system. I would urge that funding for the removal of the dams and other river restoration be given high priority by the Administration. This is one of the few river systems where salmon restoration on a large scale can realistically and economically be accomplished, and we cannot wait and study it further while the last returning salmon disappear. Please move swiftly so that we do not lose this opportunity.

Thank you for your consideration of these comments.

Sincerely,
Charles F. Adams

Charles F. Adams
6001 Seward Park Ave. S.
Seattle, WA 98118

OCT 22 REC'D

337

ENVIRONMENT ELWHA

November 1, 1993

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362-6757

RE: Elwha Dam Removal Report

Dear Dr. Winter:

Environmental concerns and the public interest require **FURTHER DETAILED STUDY** into the issues stated in your report. What is needed is **FURTHER INPUT** from community, professional, Native American and other environmental group. Please extend for 90 days the time to comment. Please issue a news release to WEC and the media encouraging all citizen groups to comment.

The scope and depth of your report however laudatory considering the minimum funding demonstrates that on such a national, precedent-setting action as razing two dams, all technical alternatives (e.g., fish ladders) be exhaustively researched before burdening the public with a 300 million dollar expenditure and risking irreversible damage to the Elwha corridor by the uncontrolled release of billions of tons of silt, an impact that your report fails to responsibly calculate.

Please accept this letter with the realization that you did the best you could within the constraints of the limited time, personnel and funding available. Your report should be considered as preliminary only, not as a blueprint for the future.

Yours sincerely,

Allan Bird
Allan Bird

CC: Editor of the Peninsula News
The Honorable Norm Dicks

482 Olympic Hot Springs Road • Port Angeles, Washington 98362
(206) 457-9550 • FAX (206) 452-3274

NOV 1 - REC'D

Richard and Genny Mann
7063 Watauga Beach Drive
Port Orchard, WA 98366

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

We have both been avid backpackers and sport-fishers for many years here in the Puget Sound area. Our favorite area for backpacking and hiking is in and around the Olympic Mountains. We regard the Elwha River as a favorite trip. For years we have heard the old stories about the huge Salmon that used to run up the Elwha. Those days of course are long gone. We are however most hopeful that someday these Salmon runs can be restored through the removal of the two dams which now block its flow. We believe that these two dams have not only done terrible damage to the Salmon runs, but that they have also provided severe insult to the earth.

We appreciate everything that you have done to support the removal of these two dams on the Elwha River. We will support you in any way that we possibly can to see that these dams are promptly removed. We hope that you will make the removal of the dams a very high priority in the Interior Department's budget and that a plan for action can be developed which will have a speedy time table for removal of the dams. We believe that these dams no longer serve any real purpose in this day and age. The power which they provide can be replaced from other sources. The highest priority is now to return the Elwha to its former status as a wild and scenic river abundant in nature's bounty.

Yours very truly,

Richard Mann
Genny Mann
Richard and Genny Mann

OCT 27

FRIENDS
earth

November 5, 1993

Dr. Brian Winter
Elwha River Restoration Team Leader
Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Dr. Winters:

Thank you for the opportunity to comment on the Department of Interior's Public Review Draft of *The Elwha Report: Restoration of the Elwha Ecosystem & Native Anadromous Fisheries*. We are very encouraged by the overall findings of the report, including the Secretary's determination that removal of both the Elwha and Glines Canyon dams is the only alternative that would achieve the expressed goal of Congress for "the full restoration of the Elwha River ecosystem and native anadromous fisheries."

We also commend the Interior Department for its extensive efforts to involve and include interested citizens in the development of this report. Friends of the Earth appreciates the open and cooperative manner in which agency personnel have worked with members of the public, and we believe that this has improved the overall accuracy and quality of the report.

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Having reviewed countless government documents, we were pleased to find the information in the Elwha Report so well organized and presented. The use of photographs, illustrations, tables and figures help to make the document easier to read and digest.

While we support the overall conclusions of the report and most of the information included, Friends of the Earth does recommend a few clarifications and revisions in order to strengthen the final report. We request the report be revised to incorporate the following specific comments in the final document submitted to Congress.

SPECIFIC COMMENTS

Pages 1-4
In Section I, *Introduction*, the description of the current status of the ecosystem and the anadromous fish runs does not adequately convey the urgency of the situation and the need to

NOV 9 - RECD

act quickly in order to successfully restore fish runs and the ecosystem. The likelihood of success is directly linked to the speed with which it occurs. Given the extreme at-risk status of several of fish stocks described in Section II.C.3. (such as pink and chinook salmon), the introduction should include the need to move forward as soon as possible with removal of the dams in order to restore the ecosystem. The longer the delay in implementing dam removal, the more at-risk the anadromous fish runs become.

Page 42
Section V.A.10., *Power*, should be revised to include as part of the reference case costs all mitigation measures which would be required if both projects were to be relicensed. This correction changes the levelized costs of power under the dam retention alternative to at least 43.5 mills/kWh, if ones uses FERC staff-recommended supplemental measures (Draft Staff Report, page 2-38.) If one includes the full range of supplemental measure requested by the resource agencies, tribe and conservation organizations, the levelized costs of power under dam retention alternative actually are higher than under dam removal.

Pages 34-35
The following information should be added to Section V.A.2., *Fluvial Processes and Conditions*:

> A natural gravel spit which extends into the Strait of Juan de Fuca, Ediz Hook is denied more than 13,000 cubic yards of material normally supplied by the Elwha River each year. Dam removal would reverse this loss of natural gravel recruitment to Ediz Hook within 10 to 20 years. The U.S. Army Corps of Engineers has spent over 3.3 million dollars of federal money since 1976 in an attempt to halt and correct the erosion of Ediz Hook. This effort has required over 400,000 tons of armor rock, gravel and cobbles to renourish Ediz Hook. Furthermore, the Corps estimates additional erosion control measures will be required every five to eight years at an approximate cost to U.S. taxpayers of $800,000 each time. Dam removal would eliminate the need for these erosion control measures.

Page 39
The following information should be added to Section V.A.6., *Vegetation*:

> The spawned out carcasses of salmon and steelhead would return nutrients to the soil, providing tons of natural fertilizer for the vegetation along the river banks. This process would likely extend a significant distance from the river and its tributaries, as animals

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drag carcasses from the stream into the surrounding brush. This will result in valuable benefits to the goal of full ecosystem restoration not available under the dam retention alternatives.

Page 96
The statement in Section VI.F., *Fish Restoration*, regarding releases of fish in previously inaccessible habitats should be clarified to note that while the habitat on the Elwha above the dams is currently inaccessible, it was accessible prior to construction of the Elwha Dam in 1913.

Page 109
The statements in Section VI.H.4.e., *exotic plant species control*, should be clarified to state that the eradication methods used would be mechanical rather than chemical.

page 115
The statements in Section VI.J.1., *Interpretive Themes*, should be clarified so that the roles of all involved parties are included in the interpretation. We request the language be revised to read:

> ...incorporating viewpoints of several agencies, governments and public interest groups at many diverse sites.

Page 122
Section VI.M.2., *Cost of Replacement Power*, should be revised to include mitigation costs which would be required for the dam retention alternative. Failure to include these costs results in dramatically under-estimated costs associated with the base case. The projects could not be licensed to operate until 2047 without inclusion of extensive mitigation measures required. Thus to estimate the costs of continued operation without inclusion of any mitigation is nonsensical. See above comments for page 42 for the type of mitigation costs which should be included in estimating the base case.

Pages 130-131
Section VII., *Summary and Conclusions*, should be revised to state that development of an Environmental Impact Statement (EIS) would begin following submission of the final Elwha Report to Congress by January 31, 1994. The development of the EIS should not wait until FY 1995. The urgency of moving forward dictates the importance of beginning ASAP. This may require some reprogramming of Interior Department budgets, including delaying until FY 1995 some Elwha related activities currently projected to occur during FY 1994.

Figure 7 on page 131 should be revised to reflect the EIS beginning February 1, 1994. As the EIS is then completed sooner, Engineering Design, Acquisition of Projects, Dam Removal, Water Quality Protection, etc. should all be move forward in time accordingly.

Pages 134-137.
Tables 13, 14, 15, and 16 should be revised to reflect the Project schedule changes requested above. This includes EIS activity beginning in FY 1994; Acquisition of Projects, Dam Removal, Water Quality Protection, Decommissioning of Projects, etc. beginning in FY 1996.

Page 157
Revise October 24, 1992 listing to state "staying" rather than "extinguishing" the FERC licensing process.

Page 158
Revise December 23, 1992 listing to include parties requesting the stay: Olympic Park Associates, Friends of the Earth, Seattle Audubon Society, Sierra Club, Department of Commerce, Lower Elwha S'Klallam Tribe, FERC, and James River II, Inc.

Executive Summary, 3rd unnumbered page.
The statement that "The EIS would be initiated at the beginning of fiscal year 1995 (October 1994)," should be revised to reflect the beginning of EIS work in February 1994 following submission of the Final report to Congress. See above comments for page 130.

In conclusion, Friends of the Earth applauds the Interior Department for an excellent report. We request the above revisions be made prior to submission of the Final report. Following submission of the final report to Congress, we urge the Secretary of Interior move forward quickly with immediate development of an EIS, as well as with acquisition of the projects. If restoration of the Elwha is to succeed, it is critical that the Interior department move forward without delay on implementation of P.L. 102-495.

We hope our comments are useful as you prepare the final Elwha Report for submission to Congress by the January 31, 1994 deadline. If you have any questions regarding Friends of the Earth's comments, feel free to contact me at 633-1661. We look forward to continuing to work with you on this important project.

Sincerely,

Shawn Cantrell
Director, Northwest Rivers Project

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Oct. 19, 1993

Bruce Babbitt, Secretary of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt,

I was very pleased to read that you support removing the dams on the Elwha River in the Olympic National Park and I want to thank you for your support for the project. The variety of huge salmon which once populated this river are gone, but it will be a great showcase for habitat restoration.

Ten years ago I moved into the Pacific Northwest from North Dakota. At the time I had friends living in Port Angeles and I remember hearing the stories of the huge fish which used to spawn in the Elwha River. At the time, I discounted most of the stories as exaggerated fish stories. I have since learned better.

This River is perfect for dam removal. The power generated by the dams is only used by the mills and there is much better use for national park land than to power timber mills. The river has great spawning habitat inside the park and is perfect for restoration.

Please move fast to implement a plan of action to get the dams down and the fish runs restored. This will not happen quickly and we need to start now to get the project accomplished in a reasonable time frame.

Once again, thank you much for your support of removing the dams.

Sincerely yours,

Gene Hart
4820 Burke Ave. N.
Seattle, WA 98103

OCT 22 RECD

BELLINGHAM
EAR, NOSE AND THROAT
FACIAL PLASTIC SURGERY

OTOLARYNGOLOGY AND RELATED ALLERGY
COSMETIC AND HEAD AND NECK SURGERY
2940 SQUALICUM PARKWAY, SUITE 203
BELLINGHAM, WASHINGTON 98225
(206) 733-0640 COUNTY LINE 384-3116
FAX 733-1034

DIPLOMATES AMERICAN BOARD
OF OTOLARYNGOLOGY — HEAD AND NECK SURGERY
R. EMIL HECHT, M.D.
ROBERT HARRIS, M.D.
THOMAS STACKHOUSE, M.D.

October 15, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Sir:

Thank you for your strong report on the restoration of the Elwha River ecosystem. I agree with you that we must remove the dams blocking the Elwha River and this represents a great opportunity for restoring an invaluable ecosystem.

I encourage you to promptly implement the Elwha River Restoration Plan, making the Elwha a high priority in the Interior Department budget, including funds needed for dam removal and river restoration an upcoming administration appropriation request. I also encourage you to help develop a definite action plan and time line for removal of the Elwha and Glines Canyon dams.

Thank you very much for your consideration.

Sincerely,

Emil Hecht

R. Emil Hecht, M.D.
REH/rd

OCT 22 RECD

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DENISE OTTOSON
4037 WOODLAND PARK AVENUE NORTH, #4
SEATTLE, WA 98103-7917
(206)545-1803

October 26, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
Port Angeles, WA 98362

Dear Sir:

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Thank you for the strong report the Interior Dept. has produced on the restoration of the Elwha River ecosystem. I agree that we must remove the dams blocking the Elwha River, and that this presents a wonderful opportunity for restoring an invaluable ecosystem.

I do urge you to push the removal of the dams along as quickly as possible, the salmon can't wait. Please make this project a high priority in the Interior Dept. budget and develop an unequivocal action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Again, thank you for your support.

Sincerely,

Denise Ottoson

Peggy A. Lingwall
6012 47th St. Ct. W.
Tacoma, WA 98466

October 19,1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Mr. Babbitt,

This letter is regarding the Elwha River. As I have a great concern for our little remaining wildlife areas I urge you to move swiftly to implement the Elwha River Restoration Plan. There is an extreme invaluable ecosystem that needs help and can't afford to wait any longer!

Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests. Thank you.

Sincerely,

Peggy A Lingwall

Peggy A. Lingwall

1500 Alaska Ave. E.
Port Orchard, WA 98366
October 17, 1993

The Honorable Bruce Babbitt
% Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt,

We want to thank you for your support of the restoration of the Elwha River ecosystem to its natural state. Its salmon are unique and deserve the attention we can now give them.

Please move the funds for dam removal and river restoration to the top of your priority list and put the project on a fast track. The fish cannot wait much longer.

Thanks for your work on this and other natural projects.

Ron & Martha Robinson
Ron and Martha Robinson

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OCT 22 REC'D

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113 Ridgetop Place
Sequim, WA 98382

23 October 1993

Mr. Brian Winter
Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Winter

I am sorry to have missed your public meeting on the proposed removal of the Elwha river dams.

We are currently observing the twenty-year anniversary of the Arab oil embargo. At that time we were searching for any stream available where a dam could be built to generate hydro-power. That day may come again. Fossil fuels are available in ever decreasing quantity. We depend on other countries for most of our requirements. Our country has no long-range energy policy. And hydro-generated power has many environmental advantages.

My views on removal of the dams in the Elwha river are contained in the attached letter. As you can see, this letter was sent to a number of people to whom I wanted my views known. I would appreciate your notice of these views.

J. A. Arnold

OCT 26 REC'D

This letter was sent to the following on 23 July 1993:
President Clinton
Secretary of Interior Babbitt
Senator Slade Gorton
Senator Patty Murray
Representative Norm Dicks

$2,000,000 for a feasibility study to remove two small dams from the Elwha River is an outrage!!!

How can the expenditure of this kind of money be justified at a time when you are going to increase the tax on social security benefits, reduce Medicare benefits, increase gasoline tax, and perhaps much more? I have been retired and on a fixed income for fourteen years. I am boiling mad at the way my tax dollars are being spent.

Does it make any sense to spend $150,000,000, maybe much more, to remove two dams and destroy two beautiful lakes that have existed for almost a hundred years? It would destroy two ecosystems and a lake fish population for the wishful thinking that salmon runs might be restored in the Elwha River. It would replace hydo-generated power with fossil fuel generated power when we are worried about global warming.

It was only a few years ago that we were searching for places to site hydro-power generating facilities. Our country's energy problems cannot be forgotten so easily. Today we depend on foreign oil for two thirds of our needs and the country still has no energy policy. The situation in the Mid-East is such that an energy crisis can re-occur at any time. Tomorrow we could again be searching for places to generate power at almost any cost.

The idea of destroying hydro generating facilities in the Elwha River is nothing but blind thinking. Justification, based on restoration of fish runs, is wrong. There are almost no salmon in the Dungeness River and many other streams in this part of our country. There are also no dams in these streams. If fish runs are to be re-established, let's stop the placing of nets across the mouth of every stream available to spawning fish and look at the practices of commercial fishing in deeper water.

The cost of destroying dams in the Elwha River, and the many years required to restore the stream below these dam sites, would be prohibitive. As a taxpayer, an environmentalist, and a fisherman, I must strongly object.

RECEIVED
MAILROOM
93 OCT 19 AM 11:08
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

30 W. 9th Street
Port Angeles, Wash.
October 18, 1993

Elwha Restoration Interagency
Team Leader Brian Winter
Olympic National Park
600 E. Park Ave.
Port Angeles, Wash., 98362

Mr. Winter:

Since the United States is deeply in debt, where is all the billions of dollars,which will be needed to destroy those dams and acquire more land for the National Park system going to come from?? Will the government be taxing those of us who live on the Peninsula to get that needed revenue or will they just print more money, throwing the country deeper in debt??

"If" those dams are removed, are those advocating it saying, "absolutely, no doubt about it the salmon will return to the river". Or is this some far fetched speculation of the federal government and environmentalists?? "Maybe" is a better word that the salmon will return. In the meantime, billions and billions of our tax dollars will have been spent for naught.

Since you very well know our electrical rates are being increased substantially by BPA, how long do you contemplate our largest employers, the two mills, will stay in the area.

I firmly believe the National Park wants the entire Peninsula to be one huge park. They have already begun acquiring private land holdings around Lake Crescent, little by little, probably Lake Sutherland is next on the agenda. I understand the U. S. Forest Service is acquiring 890 acres along the Bogachiel River in Forks. I. T. T. Rayonier agreed to sell 660 acres, another parcel owned by John Hancock Life Insurance Company of 130 acres. Another 100 acres are owned by a number of small land owners.

Where is all this money coming from to make all these land purchases? I understand it has been planned many years ago into making the entire Peninsula into one huge park with no human inhabitants only animals, birds and park rangers. Doesn't the federal government own about one-fourth of the land area in this country already,on which no taxes are being paid??

Against dam removal,

L. F. Latvala

OCTOBER 20, 1993

ROB AMSDEN
P.O. BOX 141449
SPOKANE, WA 99214-1449

THE HONORABLE BRUCE BABBITT
c/o OLYMPIC NATIONAL PARK
600 EAST PARK AVE
PORT ANGELES, WA 98362

RE: RESTORATION OF THE ELWHA RIVER ECOSYSTEM.

DEAR MR. BABBITT,

I AM PLEASED TO SEE YOU SUPPORT THIS PROJECT SO STRONGLY. I AM WRITING YOU THIS LETTER TO URGE YOU TO MAKE THE ELWHA A PRIORTITY IN THE INTERIOR DEPARTMENT BUDGET. WE MUST MAKE THE NECESSARY FUNDS AVAILABLE SO THAT THE REMOVAL OF THE DAMS CAN BEGIN IMMEDIATELY. I HOPE THAT THE DEVELOPMENT OF A FIRM PLAN OF ACTION AND STRICT TIMELINE FOR THE REMOVAL OF THE ELWHA AND GLINES CANYON DAMS IS ALMOST COMPLETE. WE BOTH KNOW THAT THE FISH CAN WAIT NO LONGER. PLEASE MAKE YOUR REQUEST FOR THE FUNDS AT THE UPCOMING ADMINISTRATION APPROPRIATION HEARINGS.

I BELIEVE THAT THIS RESTORATION PROJECT WILL BE A IMPORTANT STEP FOR ALL OF WASHINGTON STATE. WE WILL BE ABLE TO SET THE STAGE FOR OTHER IMPORTANT ECOSYSTEM RESTORATION PROJECTS.

SINCERELY

Rob Amsden
ROB AMSDEN

OCT 22 RECD

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P. O. Box 875
Lake Stevens, Wa. 98258
October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt,

As one of your constituents, I wish to let you know that I wholeheartedly support the **Restoration of the Elwha River Ecosystem.** I agree with you that removing the dams which block the Elwha River, we have an opportunity to restore this incredible resource.

I also wish to thank you for your continued efforts regarding the Alaska wilderness. My view is that with every decade which passes, more and more irreplaceable natural wonders are irretrievably lost. It is time to stop making compromises with these uniquely beautiful places on the American continent. Each time we allow financial interests to take precedence, and further pieces are split off from the few remaining wonders we have, we literally allow pieces of our heritage to future generations to be given away. At some point, if compromises continue to be made, decades in the future there will be so little left of these priceless resources that viable ecosystems will not even be possible.

Thank you for your efforts. One man really can make a difference.

Sincerely,

Tim Boland
Tim Boland

OCT 22 RECD

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TOM BENDER, ARCHITECT
38755 REED ROAD
NEHALEM OR 97131
503-368-6294

20 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

RE: ELWHA RIVER RESTORATION

Dear Mr. Babbitt,

I want to urge your administration to move forward rapidly to submit the final report on the Elwha River Restoration, to include funding for the project in the upcoming budget, and to develop and implement a speedy action plan for removal of the Elwha and Glines Canyon dams. Further delay imperils an already decimated genetic base for the anadromous fish.

I want to thank you for your support of the restoration of the Elwha River ecosystem and removal of the dams blocking the river. I have spent considerable time over the years in this area of the park, and know the potentials that this project will unlock.

Warm regards,

Tom Bender

Tom Bender

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OCT 22 RECD

Oct. 20, 1993

The Hon. Bruce Babbitt
c/o Olympic Nat. Pk
600 E. Park Ave
Port Angeles, Wa. 98362

Dear Secretary Babbitt,

We are losing salmon at an alarming rate. If something isn't done soon, they will be extinct in the wild — the best kind (wild fish). It's an invaluable resource for the Pacific NW + needs to be preserved.

Thankyou for your strong report on the 'Restoration of the Elwha River Ecosystem.' We agree with you that the dams blocking the Elwha River need to be removed. Please include funds needed for dam removal + river restoration in the upcoming Administration appropriation requests. Hopefully, all this can be done soon. Thankyou for your efforts.

Sincerely,

Mr + Mrs Paul Shemet
6600 So Simmons Dr
Clinton, Wa. 98236

OCT 22 RECD

1415 N. 40 ST Seattle 98103

20 Oct 93

Dear Sec. Babbitt,

I write you today to urge you to restore the Elwha River Ecosystem.

I had the opportunity last summer to visit one of the dams, to see the visible damage to the river and it's fish.

Please swiftly implement the E.R.P. plan; make the Elwha a high priority in your department's budget; include funds for removal of the dams and river restoration; develop a timeline for removal of the dams.

My view is, of course, motivated by a concern for the environment. But it is a matter of economics. The one - user of power from the dam can buy power elsewhere. Thank you - PATRICK HEWES

22 RECD

Constance S. Wentzel
7111 Linden Avenue North
Seattle, Washington 98103

20 October 1993

The Hon. Bruce Babbitt
c/o Olympic National Park
600 East Park Ave.
Port Angeles, WA 98362

Dear Sir:

Removing The Elwha River dams will restore a wonderful, valuable ecosystem. Thanks for your strong support on This project.

I hope you can formulate a definite plan of action and time line and make The Elwha restoration project a high priority in The Interior Department budget.

With admiration and best wishes,

Sincerely,

Connie Wentzel

OCT 22 RECD

Dear Mr. Secretary,
make the Elwha a high priority in the interior Dept. budget. Please include the funds needed for dam removal and river restoration in upcoming administration appropriation requests!

Thank you,
sincerely
Birgitta Lewinski
Robert W. Lewinski

MR. & MRS. ROBERT LEWINSKI
294 TONDA VISTA RD.
PORT ANGELES, WA 98362 USA

OCT 22 REC'D

Port Orchard 10.22.93.

Dear Dr. Winter.

Having been notified by the Friends of The Earth, I had attended the Elwah removal workshop on Monday the 18 to become more aquainted with the project.

I had heard for a long time, that the Park Service favored removing the Dam, of which I am in favor and so is appearently Secretary Babbit, however Congress is another matter.

I had gone the next day to the hot springs and on the way back, I stoped at the Dam site and the Lake, even so I had been there several times before.

The Dam itself was built, when little consideration to the wild Salmon was given, a great number of smaller Salmon streams were wiped out and Hatcheries built to be staffed by political Cronies.

Its only now becoming appearent, that the Hatchery Salmon has much smaller survival chances, stream degradation is still ongoing and now after the horse left the barn, the State Forest Practices Board has set stiffer Stream protection, enforment however is another Matter.

I wholehearttedly support the Dam removal, even there is no garanty that the Salmon will ever return to near the number before the Dam was built, there also is no Garanty that the Funds will be forthcoming.

While the Dam removal costs are a bit stiff, it is a lot more visible then other federal wasteful spending.

While I was surprised at the small number of attendents of the workshop, it was the people against it that were visible, however the project has gotten a lot of attention in the Environmental Community and other publications that there is sufficient support for the removal.

Please keep me informed regarding the project, I will write letters to my elected Representatives in support of it.

Sincerely yours

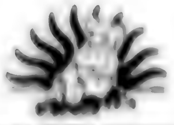
Walter H. Hoffmann

[illegible]

OCT 23 REC'D

GENE'S ELECTRIC MOTOR SERVICE, INC.

[illegible]
[illegible]
[illegible]



October 22, 1993

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362-6757

RE: Elwha River Draft Report

Dear Sir:

Regrettably, we were unable to attend the recent public workshop. It is incredibly encouraging to witness natural resource agencies actually proposing action to restore an invaluable ecosystem!

Please note that we fully support removal of both dams. It is imperative to begin this process as soon as possible.

The history of the destruction of rivers, wildlife species and their economic benefit is well known. NOW is the time to begin the learning process of rehabilitation. What a great opportunity to scientifically study methods of restitution!

Friends and family living in the Elwha River area need the increased salmon runs and we would personally like to visit the area to witness the process. In the future, all of us would enjoy increased populations of salmon and other dependent wildlife.

Respectfully submitted,

Gene & Marilyn Cripe

Gene and Marilyn Cripe

cc: Oregon and Washington
Congressional Delegation

PROFESSIONAL SALES SERVICE AND INSTALLATION OF
WATER SYSTEMS • GENERATORS • PRESSURE WASHERS • AIR COMPRESSORS
PUMPS • INDUSTRIAL ENGINES • ELECTRICAL EQUIPMENT • STOVES • ACCESSORIES

OCT 24 1993

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1238 W. 17th St.
Port Angeles, Wa. 98362
(206) 452-2660

10-24-93

Brian Winter
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Avenue
Port Angeles. Wa. 98362

Dear Sir:

I would like to strongly urge the removal of the dams on the Elwha river. It is time to act to remedy a serious mistake made a few decades ago. For a few paltry kilowatts we destroyed a superb ecosystem developed by nature over thousands of years.

In addition to allowing the salmon to return, and other life forms to flourish again, a dam-free river will prove in a small way to our descendants that we were, for once, capable of taking a rational step when it mattered.

Sincerely,

Richard A. Shea, D.V.M.

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10/24/93

Dear DR. Brian D. Winter
Elwa Restoration Team

If removing the dam will help support the restoration of salmon runs, then the dam ought to be modified/removed. The river is needed for more than energy!

Sincerely,

Nancy Hartung
726 Wiley St NW
Oly. WA
98502

OCT 25 [illegible]

10/21/93

DEAR MR. BABBITT-

WHEN I LIVED IN ARIZONA, IT WAS A RELIEF TO SEE THE INTELLIGENT ACTIONS YOUR ADMINISTRATION TOOK TOWARD EVOLVING A MORE BALANCED LAND-USE ETHIC THERE. THUS I HAVE BEEN DELIGHTED AT YOUR APPOINTMENT TO INTERIOR.

THANK YOU FOR MAINTAINING THE STRENGTH OF YOUR CONVICTIONS (IN THE FACE OF INTENSE OPPOSITION) AND SUPPORTING REMOVAL OF THE ELWHA DAMS ON THE OLYMPIC PENINSULA. WITH OUR AVERAGE STREAM AND RIVER ANADROMOUS FISH PRODUCTIVITY REDUCED TO JUST 5% OF THE HISTORICAL RUNS, IT IS PAINFULLY OBVIOUS THAT OUR ABUSE OF THIS TREMENDOUSLY IMPORTANT RESOURCE STOP, AND EVERY EFFORT MADE TO REVERSE THE TRENDS OF HABITAT LOSS AND EXTINCTION. WHILE MANY OF US ARE BUSY WITH LOCAL RIVER RESTORATION EFFORTS, IT IS GENERALLY RECOGNISED THAT THE REMOVAL OF THE ALDWELL AND GLINES CANYON DAMS REPRESENTS THE SINGLE MOST IMPORTANT EFFORT AND PRECEDENT TOWARD BRINGING BACK THE SALMON.

PLEASE MAKE FUNDING FOR DAM REMOVAL AND RIVER RESTORATION A HIGH PRIORITY IN THE INTERIOR DEPARTMENT BUDGET.

THE WATER AND POWER ISSUES HAVE BEEN FIGURED OUT. ALL THAT IS LACKING IS THE POLITICAL WILLPOWER TO CARRY THIS THROUGH. OUR "REPRESENTATIVES" HAVE REALLY BACKSLID IN THIS REGARD.

THANK YOU FOR YOUR EXCELLENT WORK. MAY THE GREAT SPIRIT GIVE YOU STRENGTH AND GUIDANCE ON YOUR PATH.

FOR THE EARTH, AND HER INHABITANTS-

OLYMPIC EARTH FIRST!
112 UMATILLA
PORT TOWNSEND
WA 98368

OCT 25 [illegible]

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October 16, 1993

The Honorable Bruce Babbitt
C/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Mr Secretary

Thank you for your strong affirmation of the need to restore the Elwha River Ecosystem. Removing the dams on the Elwha River will be the first step of many that we must take to restore and protect valuable ecosystems. Please develop a detailed action plan, secure funds and impose a schedule for removing the Elwha and Glines Canyon dams.

This is about far more than fish. This is about returning to our children and their progeny some of what my parents, and theirs, inherited – and then desecrated. They may not have known then what they were doing – but we do and we have a chance to take that step.

Thanks again – for all of us now and all who will follow.

Sincerely,

MICHAEL M. JOHNSON
7490 KENTMORE R. SE
PORT ORCHARD WA 98366

OCT 26

---

forest shomer p.o. box 619 port townsend wa 98368 (206) 385-6114

October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt,

I want to commend your support for the the removal of dams from the Elwha rivershed. In light of the increasingly dismal outlook for salmon runs on the Columbia-Snake system, it's even more important to re-open the Elwha. The recently released inventories on other Washington State salmon populations shows that unless steps are taken immediately, we may essentially be speaking of "salmon" as an historic artifact, much as we do today of Atlantic salmon runs.

There is still a long way to go in retrofitting electric power systems, from the point of generation to the point of use, for conservation and efficiency. I believe that developments in semiconductor research, alone, will obviate the need for salmon-blocking facilities like the Elwha River dams. I hope to live to see the time when we look back at this era as a stepping-stone to a more enlightened time that enjoys abundance of both power, and natural resources.

Therefore, I urge you to do all possible to secure funding to carry this precedent-setting project forward. Sincerely,

Forest Shomer

P.S. I've been a frequent visitor to the Elwha watershed since I arrived on the Olympic Peninsula in 1970.

consulting urban forester and wildflower specialist

OCT 26

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Architects Studio
Architecture, Landscape Architecture, Planning, Urban Design
Bruce Eugene Millard · Architect
Tom [illegible] · Landscape Architect

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

October 23, 1993

Dear Honorable Babbitt,

I personally wish to thank you for your strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring a invaluable ecosystem.

I respectfully urge you to move swiftly to implement the Elwha River Restoration plan. The fish and the northwest ecosystem can not afford to wait any longer. Please make the Elwha a high priority in the Interior Department budget. These funds needed for dam removal and river restoration must be included in the upcoming Administration appropriation requests. The administration must develop a definite action plan and timeline for the removal of the Elwha an Glines Canyon dams.

Thank you for you time and interest in this matter. Mankind and the salmon look forward to the waters of the northwest flowing freely again.

Sincerely,

Bruce Eugene Millard

121 North First Avenue, Sandpoint, Idaho 83864
208 263-3911, 263-4099

OCT 25 RECD

---

19 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Secretary:

We urge you to restore the natural river system of the Elwha. The dams should be removed as quickly as possible to restore the steelhead and salmon runs to the river.

Please provide funding for removal of the dams and handle this restoration as a top priority project.

Thank you for your interest in the Elwha.

Sincerely,

Walter P. Gibble

Dr. & MRS. Walter P. Gibble
120 Lorena Rd. KPN
Lakebay, WA 98349

OCT 25 RECD

352

352

October 21, 1993

Dear Secretary Babbitt

Thank you for your terrific strong report on Restoration of the Elwha River Ecosystem. I agree that we must remove the dams and do it quickly. This will be an environmental and economic opportunity for us all. Please set a budget that can quickly accomplish this goal

Sincerely

Joan Trunk

Joan Trunk
1950 15 Ave East
S

OCT 25 REC'D

The Honorable Bruce Babbit
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

10/16/93

Dear Mr. Babbit,

I would like to thank you for your strong report on the restoration of the Elwha River Ecosystem. I believe as you do that the removal of the two dams on the river provide for a great opportunity in returning this river to its past pristine state, a great deal of foresight was shown I believe by you on this matter.

I would hope that a definite action plan is put together and a time line for the removal of the Elwha and Glines Canyon dams occurs as soon as possible. This hopefully occurring at the same time that adequate funding is set aside to start the process in motion as soon as possible.

Once again I would like to thank you for your work so far and please continue you work in restoring the Elwha River back to its pristine state.

Sincerely,

Dennis J. Ast
2725 Jones Ave. NE
Renton, Wa 98056

OCT 25 REC'D

353

2323 58th Ave E.
#9
Tacoma WA 98424

Oct. 23, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 E. Park Ave.
Pt Angeles WA 98362

Re. Removal of Dams
on Elwha River

Dear Sir:

Thank you for your support for removal of the dams on the Elwha River.

I want to urge you to help the removal process to be done as speedily as possible. Money should be budgeted for this purpose & a timeline established and adhered to.

It is a tragedy that these dams were built without fish ladders. Now is our opportunity to restore native anadromous fish to the Elwha by removal of the dams.

Thank you.

Sincerely,
Rea Frederickson

OCT 25 RECD

354

P.O. Box 467
Silverdale, Wa. 98383

October 22, 1993

The Honorable Bruce Babbitt

Dear Secretary Babbitt,

We appreciate your strong report on the Restoration of the Elwha River Ecosystem. We agree that removing the dams is necessary for saving this very valuable ecosystem, which could easily be destroyed forever.

Sincerely,
Roy A. Lindstrom
ROY LINDSTROM
Lisetta Lindstrom
LISETTA LINDSTROM

OCT 25 R

354

960 Wayne Avenue
Pocatello, Idaho 83201
20 October, 1993

The Hon. Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt:

We support you in your recommendation to remove the Elwha dams, and we hope you make this a high priority in the Interior Department budget. We urge you to move swiftly to implement the Elwha River Restoration plan. The fish can't afford to wait any longer!

Sincerely yours,

Glenn Ray Downing
Glenn Ray Downing

Joan K. Downing
Joan K. Downing

OCT 25 REC'D

355

2969 74th Avenue Southeast
Mercer Island, WA 98040
October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

Thank you for your support of efforts to restore the natural ecosystem of the Elwha River in Washington State by removal of the two dams which have drastically reduced the habitat for its former spectacular runs of all species of wild Pacific salmon.

We urge that final plans for removal of the Elwha and Glines Canyon dams be made as soon as possible and that implementing funds be included in the upcoming budget.

Sincerely yours,

Ward & Lois Irwin
Ward and Lois Irwin

OCT 25 REC'D

355

Mr Lee R Trotter
6012 E 102nd Street
Tacoma , WA 98446

October 22, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 E Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbitt

Among the various reasons I supported the Clinton/Gore platform during the last election was their strong commitment, especially on Mr Gore's part, toward preserving and restoring the environment. As you might imagine I was very pleased with your subsequent appointment to the position as Secretary of the Interior. Having been a long time supporter of such groups as The Wilderness Society, The Nature Conservancy, American Rivers and other groups I am familiar with your background and do not believe a better appointment could have been made.

At the same time I have been disappointed with progress to date on controlling grazing on federal land, mining reform legislation and potential threats to amend the Endangered Species Act. However, I understand that these things take time and that there is a limit to how many issues can be taken on at the same time. But I believe the time has arrived for action on the dams on the Elwha river.

As both a concerned conservationist and an avid steelhead and salmon fisherman I cannot imagine a better opportunity than this to demonstrate the commitment of yourself and the administration to the cause of conservation. I know you have stated your support for the removal of both dams and I want to thank you for the report of the Department of the Interior. We need to move swiftly to implement the restoration plan and this of course means that this must be a high priority budget item to assure the necessary funds are available. Dates need to be set so that people can measure the progress that is being made.

Having been born in Washington state 57 years ago and having been actively involved in outdoor activities all of my life has enabled me to witness most of the change that has occurred to our environment in Western Washington. Trying to rectify past sins is always unpleasant, whether it is the over harvesting of timber or the reallocation of the remaining fish. The controversy over the Spotted Owl today is not much different from the concerns raised over the Boldt decision a few years ago. But I believe you will end up getting broad based support for removal of these dams and restoration of the fisheries from both the Indian Tribes and the non Indian population of this state. This should be the first of many dams to ultimately be removed for environmental reasons, and there's no place better to start than with the Elwha and Glines Canyon dams.

Sincerely,

Mr Lee R Trotter

Box 1364
Port Townsend, WA
98368
20 Oct 1993

The Honorable Bruce Babbitt
% Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Gentlemen:

Thank you for your statements and report about restoring the Elwha River. Your support is immensely valuable to those of us who have advocated removing the dams for many years. I urge you to move forward with the final report, and seek funding as quickly as possible. Every year the fish have to wait there will be fewer of them, and we no longer have the luxury of time. This is a project that must be executed promptly and correctly to minimize the degree to which we "gamble" with fish stocks. A definite action plan and timeline for removal of Glines & Aldwell dams is called for in this situation. I expect that funding could be the hardest aspect of this project, and I wish you every success.

Thanks again for your efforts & support.

Sincerely,

Catherine Butler

OCT 25 1993

October 21, 1993

Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Secretary,

I urge you to support the removal of the Elwha and Glines Canyon dams. We must act quickly to solidify the opportunity to restore the ecosystem and fishing productivity of this invaluable area. Please make this a high priority project and immediately request appropriations to ensure development of a successful plan.

Sincerely,

David Nettleton
406 10th St., C301
Kirkland WA 98033-6359

OCT 25 RECD

October 15, 1993

The Honorable Bruce Babbitt, Secretary
U.S. Dept. of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

By the end of October, another milestone will be reached in deciding on a proper course of action for restoring the anadromous fishery resource on the Elwha River in Washington State. This watershed leading in one of our most unique National Parks offers an ideal experimental platform for learning how to remove what have become unnecessary hydrostructures and return rivers to a semblance of their original conditions. The government's determination and plan of action for these dam removals and fishery restoration efforts on the Elwha should become a paradigm for similar actions likely in years ahead for unnecessary hydrostructures from one end of the country to another.

I was born in Oklahoma, and I have seen MANY public works boondoggles. I have seen travesties like the Lake Optima project (a reservoir that never filled), a Bureau of Reclamation calamity at Foss on the Washita River that "leaks" like a bleeding ulcer at the dam and needs reverse osmosis to provide drinking water from its highly mineralized contents, another boondoggle on McGee Creek, where the government tried to pretend that a reservoir bounded by a State Park and a big hatchery still wasn't "finished" since all the fish were showing up full of mercury contamination, a Corps disaster on the upper Deep Fork, where Lake Arcadia (an "urban sportsman's paradise") became the settling basin for the urban stormwater runoff from the northern side of a large city, several other Corps structure (e.g., Oologah and Sardis) that have helped drive more species of our marvelous freshwater native shellfish to the brink of extinction, and even a shady deal to de-designate a State Scenic River in order to get some cheap loans on a lake with a ridiculous FERC permit as the bait. This sort of madness HAS TO END. The dams on the Elwha are a good place to start.

Sincerely,

William S. Cooter, Ph.D.
12013 N. Exeter Way
Raleigh, NC 27613

OCT 25 RECD

357

357

Melissa Kohler
1008 Ryan Avenue
Bremerton, WA 98310

October 18, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

I am writing to you regarding the Elwha River and the two dams which are now under consideration for being removed. I am now a Senior at Bremerton High School which is very near to the Olympic Mountains. Although I am still young, I have had a great deal of experience hiking in the Olympic Mountains. I have been hiking since the age of 11, mainly with my aunt and uncle.

I think that it is a shame that these two dams were ever built on the Elwha River. They are not only an eye sore, but they have obviously damaged the wild fish runs. Please see what you can do to free the beautiful Elwha River.

Yours very truly,

Melissa Kohler

Melissa Kohler

Roger and Susan Kohler
1008 Ryan Avenue
Bremerton, WA 98310

October 20, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

This letter is to let you know how much we appreciate your support for removing the two dams on the Elwha River near the Olympic Mountains in Washington State. We both believe that these dams should be removed as soon as is possible to restore the Salmon runs on the Elwha River and to restore the land to its former condition. We believe these dams are both unsightly and unnecessary and serve only very narrow commercial interests.

Please see what you can do to speed up restoration of this beautiful River.

Yours truly,

Roger and Susan Kohler

Susan Kohler
Roger Kohler

OCT 25 REC'D

3315 Tarabochia Street
Gig Harbor, WA 98335

October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Parks
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

As a lover of the Olympic Mountains here in Washington State, I thank you very much for your support of the plan to remove the two dams on the Elwha River. It is my understanding that these two dams are unnecessary and serve only to block the river's former salmon runs. These salmon runs represent a far greater value than any hydroelectric power which these dams could ever produce. In addition, the elimination of the eyesore represented by the two dams is a worthwhile goal just by itself.

Please do what you can to implement plans to remove these dams from the beautiful Elwha River. Please see what you can do to obtain adequate funding to accomplish this in the shortest possible time.

Yours truly,

Melissa Moser

Melissa Moser

359

OCT 25 RECD

4423 Harbor Country Dr. A6
Gig Harbor, WA 98335

October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Parks
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

Please accept my sincere thanks for your very strong support of plans to restore the Elwha River here in Washington State by removal of the two hydroelectric dams which presently block its flow. I am an avid lover of the outdoors and would very much like to see this beautiful river restored to its pristine condition. I believe that it is also very important to restore the salmon runs which used to frequent the Elwha. It is my understanding that the electric power produced by these two existing dams can easily be replaced from other sources. Inasmuch as the dams are not necessary, and inasmuch as they are unsightly and are damaging the ecology of the river, I am hopeful that you will be able to expedite a plan for their prompt removal.

Please take all possible steps to make restoration of the Elwha River a major priority in the budget for the Department of the Interior. Your efforts are appreciated.

Yours very truly,

Kristen Colyar

Kristen Colyar

OCT 25 RECD

359

360

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362

26 October 1993

Dear Dr. Winter,

I attended the workshop held on the 18th of October and did not feel my question on the river corridor maintenance and control was satisfactorily addressed. The premise I presented was if the Queets with it's corridor has habitat problems affecting migratory species what safeguards are contemplated to prevent similar impacts to the Elwha River outside of park boundaries? I understand a study of this problem is underway and no doubt will be covered in the forthcoming EIS on dam removal.

On a recent trip to the upper Elwha at Krause Bottom I crossed onto a island walking across a old tree recently blown down it's root system weakened by stream erosion, eventually the tree will break up and add to other log jams in the river and with each flood move towards the sound. The river from Lake Mills to it's mouth will dramatically change once the river reverts back to it's natural state, flood plains and surge points at present contain human habitat and service roads something to think about, but, back to my question, (I repeat,) "will the corridor and all watersheds flowing into the Elwha be maintained to prevent conditions similar to the Queets River?"

Sincerely Yours,

Michael V. Evanoff
201 E. Prairie
Sequim, WA 98382

OCT 28 RECD

October 11, 1993

Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362-6757

RE: Elwha Dam Destruction

Save the dams! Build some fish farms!

Both the Glines Canyon Dam and Elwha dams provide much needed electric power. Why get rid of something we need, especially in a growing area like the Olympic Peninsula! The fish can be grown larger, fatter and healthier under a controlled environment for commercial use. This would enable a whole new company and set of jobs for people. Leave the salmon that migrate back to the rivers for the Indian Reserves to catch at the mouth of the river, and let the electricity flow.

What will be used to replace the power that the dams now provide? Would we be using atomic power, which is not so ecological these days - never mind the expense! The dams are already there, after 65 years, I don't imagine the old fish would even care to return to those streams, let alone remember where they were.

Fish farms would provide income to people who need jobs.
Fish farms would provide an abundance of any kind or size fish you'd want or need.
The dams would provide needed electricity already in place.

So save the dams.

Sincerely,

Gayla White

Gayla White
8315 Jones Ave. NW
Seattle, WA 98117

(206) 622-2141

RECEIVED 10/13/93

360

Dear Mr Babbitt,

I am a resident of Port Orchard which is about a two hour drive from Port Angeles. Being an avid hiker and backpacker, I spend a lot time in the Olympics. Since becoming a resident in Washington in 1962 it has become my very favorite area because of its diversity and beauty. The Elwha is of course the backbone, and I agree with you that the dams must be removed on the Elwha if we are going to restore this invaluable ecosystem.

Please move swiftly to implement the Elwha Restoration Plan. How much longer can the fish wait? Some species are already gone or are very close to being gone.

Please make the Elwha a high priority in the Interior Department budget and please develop a definite plan and time table for the removal of the Elwha and Glines Canyon dams.

OCT [illegible] RCD

Thank you

Robbie [illegible]
P O Box 357
Manchester, WA
98353

Dear Bruce Babbitt, to express the way I feel about the Elwha River. I'm going to tell you a story. Don't worry it is short but sweet. How should I start? Alright here goes. My friend died in March 91 I believe. One of my best friends committed suicide. I was very sad and for a long time couldn't go to Port Angeles or the Elwha River Because that's one of the places that we went together. You see the River was symbolic to me, it ment growth friendship and happiness. Now how this relates to the fish and the Dam. Is those fish are dieing because they can't get past the dam. Like I couldn't go to the Elwha These fish need to be able to swim freely. With the dam there they can't use their natural ways of living. Please act Now

Save the Fish

Thank you for reading my letter

Sincerely

Ella [illegible]

OCT 25 RECD

-122

10/21/93

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, Wash

Dear Sir:

This letter represents sentiments of me, my family, and my late husband, Walter P. Hoffman, who worked all his life for causes like this.

Thank you for the strong support on the Restoration of the Elwha River Ecosystem. We agree with you that we must remove the dams

blocking the Elwha River and that the pressure to do this should be great. This presents a fine opportunity for restoring an invaluable ecosystem.

OCT 25 RECD

As long time members of the Mountaineers, [illegible] [illegible], Sierra Club, Seattle Audubon Society, and life-long skiers, hikers, and supporters of all that makes our country strong and beautiful and a [illegible] place in which to raise our children and grandchildren, we urge you to act swiftly to implement the Elwha River Restoration Plan. The fish cannot wait any longer.

The public already [illegible] [illegible] programs in the Interior Department budget. These include funds needed for dam removal and river restoration in the upcoming administration appropriation request. There should be a defined action plan

for the removal of the Elwha and Glines Canyon dams.

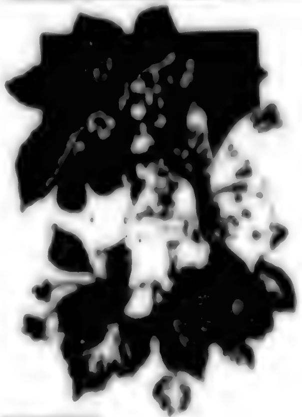
This is also the feeling of our daughters and sons and their families and even the grandchildren.

[illegible] is now, at least for now, but the dams are slated to be removed and which [illegible] [illegible] [illegible].

We all support this cause and wish we all [illegible] [illegible] [illegible].

Sincerely

(Mrs. D.B. Hoffman) Dorothy W. Hoffman



908 Jackson
Port Townsend, WA 98368

364

Oct [illegible], 1993

Bruce Babbitt
c/o Olympic National Park
Port Angeles, Wash

Dear Mr. Babbitt

I appreciate that you endorse the plan to restore the Elwha River. If the fish are to survive, action must be taken very soon to remove the offending dams.

My hope is that the administration will fund this project quickly and that the actual removal can get started as soon as possible.

Thank you
Jim Heffernan
[illegible] N E [illegible] Place
Seattle, Wash [illegible]

OCT [illegible] RECD

Oct. 21, 1993

Honorable Bruce Babbitt,

I agree with you in removal of dams blocking the Elwha River. Thank you for the strong report on the Restoration of the Elwha River Ecosystem.

Sincerely
Gail Newbaum
130 SE Whitney St.
Camas, WA 98607

OCT 25 RECD

364

Dear Mr Babbitt,

You have my full support for restoring the Elwha River. In these days of growth and development it is encouraging to see someone with the insight to peceive of "natural" alternatives. Down with the dam!

I am a river guide and fisherman here in Washington State I used to work for Gaylord Staveley in the Grand Canyon, two winters on the N. Rim. Saw you speak at the Boatman's Seminar one spring. Keep up the good work! - Steve Taylor

---

October 21, 1993

To - The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles WA 98362

From - [illegible]
[illegible] Ave
Sequim, WA 98382

Re - Removal of Elwha Dams

Please add my vote to remove dams on the Elwha

- [illegible]

October 21, 1993
2102 [illegible] Ave S
Seattle WA [illegible]

Mr Babbitt

Thank you for your efforts to remove the Elwha and Glines Canyon dams.

OCT 25 RECD

10-21-93

Dear Mr Babbitt

Thank you for your strong support on the restoration of the Elwha River ecosystem. I would urge you to move swiftly to implement the Elwha restoration plan, make the Elwha a high priority in the Interior Dept budget and develop a definite action plan & timeline for the removal of the Elwha & Glines Canyon dams

Sincerely

Pamela [illegible]
[illegible] Ridge Circle
Camano Island, WA
98292

OCT 25 RECD

October 14, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362

RE: REMOVING THE ELWHA DAMS

Dear Secretary Babbitt:

Thanks for your support for removing these dams.

This will be a costly project, but it will be worth every penny spent. It is a true investment in our future.

I have walked just about every foot of this river, from the snow finger that is its source to the upper dam. This is obvious first class fish habitat - you don't need to be a fisheries biologist to see that! Further, the upper dam has no place in the Park.

Because of the cost, it may be necessary to phase this project over a longer time than otherwise necessary. If this is the case, I would urge that the work be at least started as soon as possible, with a clear plan of action and schedule.

Again, thanks for your support, and all the other good work that you have been doing!

And let's get started on removing these dams!

Sincerely,
Glenn Eades

Glenn H. Eades
16100 NE 57th Street
Redmond, WA 98052

10/15/93

Bruce Babbitt

Dear Sir

I am writing to urge you to do what you can to give priority in The Interior's Program to restoration of the Elwha River on the Western coast of the United States in The State of Washington.

These fish, who have seen other species extinction, are facing oblivion. They are right now crying out to us to save Them.

Tho a few years from now we get rid of the dam, That does not save the fish who now need a way to go up-river to continue Their generations, Their families.

Please include funds needed for dam removal & river resteration in upcoming administration appropriation requests.

Regards
Roy McMurtry

Roy O. McMurtry
2924 125th Ave N.E.
Bellevue, WA 98005-1534

10/15/93

10 13 93

Secretary of The Interior
of The United States
The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park
Port Angeles, WA 98362

Dear Secretary Babbitt;

Thanks for the strong report on the Restoration of the Elwha River Ecosystem. Yes! we MUST remove the dams blocking the river in order to restore the ecosystem there. Please do all you can to see that this is done quickly — that the Elwha is a high priority in the Interior Dept budget. And please, create a definite action plan and timeline for removing the dams (Elwha + Glines Canyon both)

Sincerely,

[illegible]
PO Box 31925
Seattle, WA
98103

Scott M. Miller
10210 N.E. 19th Place
Bellevue WA 98008-2552
(206) 562-0730 (H)

October 13, 1993

Dear Secretary Babbitt,

I would like to thank you for your strong support of the Restoration of the Elwha River Ecosystem. I fully agree with your plan to remove the dams blocking the Elwha River. Now is the time for action, and I strongly urge you to make this a high priority in the Interior's Department budget. I also look forward to seeing a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

thank you in advance for you expedient action.

Sincerely,

Scott M. Miller

RECEIVED 10/15/93

RE 10/15/93

Hot air ballooning is an annual summer event in the Crested Butte area. Views of Mt. Crested Butte ski village in the foreground and the historic town of Crested Butte in the background.

ROCKY MOUNTAIN IMPRESSIONS.

Thanks for being such a conscientious leader of our country & and thanks for being conscious of our Elwha River Restoration Plan. Please give it top priority & needed funding.

Judy

RMCB-101

Judy Marshall
2122 41st Ave SW
Seattle WA 98116 Photographed by Nathan Bilow

The Honorable Bruce Babbitt
c/o Olympic Nat'l Park
600 E Park Ave
Pt Angeles WA
98362

OCT 25 RECD

Ms. Janice Kremmayr
14020 State Route 9 Se
Snohomish, WA
98290-9312

Oct [illegible]

PM
23 OCT
1993

FAIR HOU
TWENTY-FIV
OF OPENING

Dear Secy. Babbitt:

Thanks for your strong stand on the Elwha River Ecosystem! I agree the dams blocking the river must go.

Move swiftly--the fish can't afford to wait any longer!

Sincerely,

Janice W Kremmayr

HON. BRUCE BABBITT
C/O OLYMPIC NATIONAL PARK
699 E PARK AVE
PORT ANGELES WA 98362

OCT 25 RECD

369

DEAR SECRETARY BABBITT, OCT 21, 1993

THANKS FOR THE CLEAR RECOGNITION OF THE NEED TO RESTORE THE ELWHA RIVER. PLEASE MOVE FORWARD SWIFTLY TO IMPLEMENT THE RESTORATION PLAN. IT WOULD BE TRAGIC FOR MORE SALMON RUNS TO BECOME FULLY EXTINCT. IT WOULD PROVIDE JOBS FOR THE AREA HIT HARD BY DECREASES IN LOGGING. THANK-YOU FOR THIS CONSIDERATION

SINCERELY

Carrie M. B[illegible]

CARRIE M. B[illegible]
12506 S.W. [illegible]
VASHON WA 98070

OCT 26 [illegible]

Dear Mr. Babbitt, 10-21-93

Thanks for the strong report on the Restoration of the Elwha River Ecosystem! I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring a invaluable ecosystem.

Sincerely,

Jarl Locker-Jensen

OCT 25 [illegible]

Dean A. Drugge
831 NE 85th St.
Seattle, WA 98115

Brian D. Winter
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362-6757

Dear Mr. Winter:

I heard that the first monies (for study) of the removal of the two dams on the Elwha may be appropriated from Congress. This is very exciting news indeed. The Elwha and Glines Canyon dams can't be removed fast enough. However, I understand that this process will take years because of our lack of experience in doing this form of major restoration, and the concern for the surrounding environment and natural forces. The thought of a free flowing Elwha is also exciting.

Please maintain talks and coordination with the local tribal groups so that this process is as quick and efficient as possible. Respect for customs and indigenous people should be considered. If this removal goes well the funds will continue, relationships can build, and maybe this process can be used elsewhere.

Best wishes with a great restoration project.

Sincerely,

Dean A. Drugge
Dean A. Drugge

OCT 28 [illegible]

10/18/93

Mr. Brian Winter
Elwha Restoration Interagency Team
Olympic Nat'l Park
600 E. Park Ave
Port Angeles WA 98362

Dear Brian,

I'm writing to ask you to implement the Elwha Restoration Plan. Please make it a high priority. Five species of Pacific Salmon are dependent on the Elwha!

Please remove the Dams right away!

Thanks, Bill Scott
4230 NE 110th St
Seattle WA 98125

OCT 28 [illegible]

October 29, 1993

180 Summersville Dr
Centralia, WA. 98531

Dear Dr. Brian Winter,

We attended the workshop in Port Angeles on 10/18/93 about the proposed Elwha River Dam Restoration.

We approve of this project and hope that with the God agreeing in this project, you will be empowered to proceed with this unique concept of fish, wildlife and habitat restoration. Thank you

Sincerely

Nancy G. B. First

(206) 736-3330

OCT 26 REC'D

Mr. John A. Lombard
305 Bellevue Ave. E., Apt. 203
Seattle, WA 98102

October 24, 1993

Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

RE: Restoration of the Elwha Ecosystem

Dear Secretary Babbitt:

I am writing to express my profound appreciation of your stewardship of America's public lands and to state my agreement with you that there is an "extraordinarily compelling" case for removal of the Elwha and Glines Canyon dams to restore the Elwha ecosystem and the native fish runs of the Elwha River.

Northwest fisheries are suffering from a variety of causes wrought by man; solutions will require comprehensive actions that will be expensive and painful to the entire region. It would be best if most of these can be initiated at the regional or local level. However, the federal government can both inspire better local actions and improve its moral authority to suggest what those actions might be by taking responsibility for those that are under its own control. Restoration of the Elwha should be a high priority in the budget of the Interior Department. I hope that you can develop an action plan and budget to remove the dams on the Elwha as soon as possible.

Thank you again for the wonderful and inspiring leadership that you have already shown in the stewardship of our public lands. To have a Secretary of the Interior who has not only read Wallace Stegner but who has understood and appreciated him and who attempts to put those ideals and that sensibility into practice is almost breathtaking after the last twelve years' With great admiration, I am,

Yours Sincerely,

John Lombard

John Lombard

OCT 26 REC'D

The Honorable
Bruce Babbit
Secretary of the Interior
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA
98362

October 25, 1993

Dear Mr. Babbit,

Your report on the Restoration of the Elwha River Ecosystem has filled me with thanksgiving and delight. I have been reading about the possibility of removing the dams, and I do heartily agree that it should be done as quickly as possible. 373

My husband and I have been there on the Peninsula and in the Park many times. We are Washington residents of many years, and have followed the course of the developments. It is time for us to recognize the need to protect the wilderness and all the fish and wildlife.

Please do all you can to have the dams removed and restore the river. Thank you!

Florence M. Windell
& Arnold O. Windell

OCT 26 RECD

---

522 N. Libby Rd #425
Olympia, Wa 98506

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave.
Port Angeles, Wa. 98362

Dear Sir:

Thank you for the opportunity to speak up for fully restoring the ecosystems which have been destroyed by the Elwha and Glines Canyon dams. And, with the hope that such action may set a precedent.

Sincerely yours,

Richard A. Benjamin

OCT 26 RECD

373

Oct 27, 1993

Dear Bruce Babbitt

We urge the restoration of the Elwa River to its pre dam condition. Salmon runs are important and the power needs can be met in other ways.

Dam removal and restoration work will be difficult and there will be conflict. I believe the conflict can be managed and that the political momentum behind restoration is now present and should not be lost.

Please give the Elwa river restoration high priority in the Department's budget

Sincerely,

Ward C Miles
Alice C. Miles

3900 Libby Rd NE
Olympia WA 98506

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles WA
98362

Dear Sir:

Am writing to urge all speed in restoring the Elwha to its pristine free flowing condition -- spawning ground of the largest Chinook on the West Coast. The value of a free Elwha is historical, spiritual, ecological & practical. It is a significant step we can take in healing a peninsula that has suffered more depredation than its deserved.

I urge the administration move forward & submit the Department of Interior's report on restoring the Elwha to the administration. All steps should be taken as quickly as possible to remove the Elwha & Glines Canyon Dams & restore salmon access to the wild heart of the mountains. Access to these spawning grounds is critical. It is a moral imperative -- the dams violate multiple laws & statutes.

For returning the salmon to their "Mountain in the Clouds" I am

Sincerely

Bill Yake
16311 Old Hwy 99 SE
Tenino WA
98589

OCT 28 RECD

8331 Libby Rd NE
Olympia, WA 98506
Oct 25, 1993

Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Bruce Babbitt —

Thank you for your support of the Elwha River Restoration Act. I agree we must remove the dams which block the Elwha River, to restore this ecosystem. Please make this a high priority in the Interior Department budget, and include funds for dam removal & river restoration

375

Sincerely,

Katherine C. Mallalieu
Katherine C Mallalieu

OCT 26 RECD

1107 BRAWNE AVE NW
OLYMPIA, WA. 98502
10 · 23 · 93

BRUCE BABBIT
c/o OLYMPIC NATIONAL PARK
600 E. PARK AVE.
PORT ANGELES WA 98362

DEAR BRUCE BABBIT —

I HEARTILY SUPPORT YOU IN YOUR EFFORT TO RESTORE THE ECOSYSTEM OF THE ELWHA RIVER. AS A MOTHER OF TWO CHILDREN, I WANT TO TELL YOU ON THEIR BEHALF HOW MUCH WE LOVE THE FISH & FEEL THAT ALL LIVING THINGS ARE INTER-CONNECTED. PLEASE DO EVERYTHING YOU CAN TO PROTECT THIS HABITAT! WE SUPPORT THE REMOVAL OF THE ELWHA AND GLINES CANYON DAMS.

THANK YOU FOR YOU EFFORTS —

SINCERELY —

LISA EDWARDS

OCT 26 RECD

375

Ohanapecosh, Oct 23/93

Dear Secretary Bruce Babbitt,

I am *overjoyed* by your support of the removal of the Elwha Dams and return of that river to wild and free-flowing. The restoration of fish runs amounts to a great restoration of hope, through the knowledge that also even an impenetrable steel and concrete structure, if misplaced, *can* be removed and environmental healing take place.

376

Now I hope the funding for dam removal and restoration efforts will be made a high priority in Congress.

A by-product of this decision (to remove the dams) will be an unprecedented opportunity for young people - (adults, too) to learn about some of the interconnections in the environment, and hopefully there may be an opportunity for *many* people to help with site restoration, and thereby to grow more familiar with "their" park and take pride of ownership and protection of its resources.

Finally, return of the Elwha River to its free-flowing nature, with in time return of its great fish runs, will bring a sense of wholeness to Olympic National Park.

Thank you. *Thank you*.

Sincerely,

Margaret Enderlein

I've just completed 5 weeks of volunteer effort doing site restoration in Mt. Rainier Park, so I understand something of the challenges & hard work along with the rewards, involved.

I shall post this in Seattle tonight & hope it makes your comment deadline.

OCT 26 RECD

11064 Exeter Ave NE
Seattle, WA 98125

376

Friends of the Elwha
PO Box 1521
Pt. Angeles, Wa. 98362

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Pt. Angeles, Wa. 98362

Dear Secretary Babbitt,

I thank you for your strong report on the Elwha River Ecosystem. I have read this report and agree with almost everything contained therein. I urge you to keep in mind that time is of the essence with this project and we need to do everything possible to move things along as expeditiously as possible to insure a complete recovery. A definite plan of action needs to be developed and a strict timeline put in place for the removal of the Elwha and Glines Canyon dams. The salmon and all creatures dependant on them have been waiting almost to the point of extinction. It is apparent from all the facts available that both dams must be removed for a complete restoration of the Elwha habitat. I believe that anything short of full restoration would be an insult to future generations. I urge you to make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

377

Sincerely,
James D. Curnew, President
Friends of the Elwha

OCT 26 RECD

8619 Univ Pt Cir
Bremerton WA 98310

October 23, 1993

Dear Secretary Babbit,

I am writing in support of removing the dams from the Elwha. I believe it is one of the most beautiful rivers in the US and think it is extremely important to take this incredible opportunity to restore the original habitat and salmon runs.

Thank you very much for your tireless efforts to preserve the wild places in our country, and for going the extra mile to restore the Elwha.

Sincerely,
Thomas Lilly
Bremerton WA

377

October 25, 1993
Box 611
Port Townsend, Washington
98368

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, Washington 98362

Dear Secretary Babbitt,

Thank you for your strong support for the removal of the dams blocking the Elwha River. This is the sort of positive action I had expected and hoped would come from the Clinton Administration in general and your appointment in particular. I hope you move swiftly by making the Elwha dam removal and river restoration funds a high priority in the Administration's appropriation requests. The grave threat to salmon in so many other river systems, e.g. the Columbia, makes their restoration in the Elwha all the more urgent.

Thanks again for your support.

Sincerely
Jim Rosenthal

378

OCT 26 1993

Roger Rosentreter
1423 E. State
Boise ID 83712

Dear Mr. Bruce Babbitt

22 Oct. 193

I would like to urge you to move forward on the dam removal & restoration of the Elwha River. This river if allowed to flow could be a part of the Great NW Rainforest & could support Salmon once again. It could provide river running & could be an example for the developing countries to consider more carefully which Rivers they choose to regulate by Dams.

Please move forward soon on the Elwha River restoration.

Sincerely,

Roger Rosentreter

OCT 26 1993

377

Keith D. Peters
1 Mi. McDonald Rd.
Port Angeles, WA

October 25, 1995

Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Sir:

I hold the opinion that the majority of the rivers and streams in America are vastly altered and often devastated by the encroachment of man and his machines.

The only rivers that are truely in their natural state are those that are within the boundry of a National Park. The Elwha is one of these rivers.

Two chunks of concrete prevent the Elwha from being a national treasure. It's time to remove the dams. The Elwha has been harnessed long enough.

Please move quickly to implement the Elwha Restoration Plan. Along with dam removal and restoration I offer this advice :

a) allow no dikes, retaining walls or restrictions to be built on the river to restrict its natural desire to meander outside of the Park.

b) allow no further building, development, construction or human encroachment within one half mile of the river outside of the Park.

c) allow no more water to be removed from the river.

d) manage the fish harvest in the future based on spawning escapement. No fish removal until escapement goals have been met.

e) establish limits for human recreational use of the river such as rafting, canoeing and drift boating.

f) allow no motor driven vessels on any part of the river.

I feel the above are necessary during and after restoration. If we want a natural river forever we must give it extra protection or we will not accomplished and preserve what we set out to do.

Respectfully,

Keith D. Peters

OCT 26 1995

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Will you please insist on immediate funding in your budget and removal of Elwha and Glines Canyon Dams so the salmon may be restored.

Thank you for wisdom. Irresponsibly populating man is worst predator and must stop power demands.

295 Fleet
Port Ludlow, WA 98365

E. ZAHN

OCT 26 1995

Thank you for recommending the removal of the Elwha and Glines Canyon dams on the Elwha River. I agree with your views and enthusiastically support these measures. Maybe there is still hope for natural salmon runs after all - J. Stuckey

OCT 20 1995

Thanks for supporting the removal of the 2 dams!

It's a great opportunity to correct a great wrong which should never have happened in the 1st place.

Please move swiftly to implement the Elwha River Restoration plan and make sure it gets high priority - the Interior Dept budget - including dam removals as well as river restoration.

Please include a definite action plan as well as timeline for the removal. OCT 28 1995

Sincerely,
Nancy Hatch

Dear Bruce Babbitt,

I support your idea for restoring the Elwha River Ecosystem by removing the dams blocking the river. We have ravaged our river ecosystems throughout the nation, and so this is an exciting and very important opportunity for restoring an invaluable ecosystem, especially since the river flows out of the protected Olympic National Park. So many rivers have a lot of water quality problems stemming from human activity along their shores, but the Elwha Rivers' main problems are created by the dams. Their removal would rapidly allow the river ecosystem to restore itself to a healthy condition.

It is important to implement dam removal as soon as possible, since anadromous fish populations have been decimated. The longer we wait, the less chance these fish have to recover, the greater their chances for extinctions. Too many fish runs have already gone extinct. Its a shameful loss of precious resources. I believe having a definite timetable for dam removal would be helpful.

Please make the Elwha Restoration a high priority in the Interior Department budget and in Administration appropriation requests.

Thank you! I support your plan.

Sincerely,

James C. Roberts

James C. Roberts
Rt.1, Box 45F
Palouse, WA 99161

P.S. Hatcherie raised fish are in no way a substitute for wild fish

OCT 27 RECD

1039 N.E. 91st Street
Seattle, WA 98115-2833
25 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

We would like to thank you for your strong report on the Restoration of the Elwha River Ecosystem. We agree with you that we must remove the Elwha and Glines Canyon dams that are blocking the Elwha River. We have an important opportunity to restore the natural resources of an invaluable ecosystem.

We would appreciate it if you would make the restoration plan a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Also, please move swiftly to implement the Elwha River Restoration plan. The salmon need time to make a comeback. And please develop a definite action plan and timeline for the removal of the two dams. Think of the historic move you will be making!

Thank you for your consideration.

Sincerely,

Diane Larson Robert Wallace

Diane Larson Robert Wallace

OCT 27 RECD

October 24, 1993

Honorable Bruce Baobitt
C/O Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Sir,

Please count me as one who supports the removal of the Elwha dams. This is a great opportunity for restoring an invaluable ecosystem.

Sincerely,

Bob Byrd

Bob Byrd
17704 NE Hidden Dell
Brush Prairie, WA 98606

October 23rd, 1993

Dear Secretary Babbitt,

Thank you for your report on the Restoration of the Elwha River Ecosystem. I agree with you that the dams blocking the Elwha River must be removed. This presents a great opportunity for restoring an invaluable ecosystem.

I ask you to move quickly to implement the Elwha River Restoration plan. Please make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Please develop a definite action plan and timetable for the removal of the Elwha and Glines Canyon dams. Thank you very much for your time!

Sincerely,

Mike Sullivan
2941 Epaulette Street
San Diego, CA.
92123-3712

Mike Sullivan

OCT 27 REC'D

OCT 27 REC'D

BLANK
PAGE

PO Box 8?63
FH WA 98250
Oct 21, 1993

Dear Bruce,

Thanks for your strong report on the Elwha Restoration!

I agree that we must remove the dams blocking the Elwha River. What a great opportunity to restore this remarkable ecosystem.

I urge you to move swiftly to implement the Elwha River Restoration plan. Please make the Elwha a high priority in the Interior Dept Budget & include funds needed for Dam Removal in upcoming Admin appropriation requests.

Go for it!

Thanks,

Linda S. Helms

OCT 27 [illegible]

Nov. 3, 1993
244 Lewis Rd.
Port Angeles, WA.
98362-9162

Dr. Brian W. Winter, Team Leader
Elwha Restoration Team
Olympic National Park
600 East Park Ave.
Port Angeles, WA.

RE: Removal of two lakes, two Elwha Dams.

Dear Sir:

PARK My husband and I do agree that spending **Millions** in tax payers money could be put to better use than destroying the two lakes and dams on the Elwha river.
We feel alot like other people in Clallam County who have been raised here that the National Park is using the indians, the wildlife socie'ys, and fishermen for their own means to get more property by getting the dams removed. ITS BEEN IN THEIR **MASTER PLAN**, to keep buying more property-the park could care less for **fish enrichment!**

SHOW us FIRST First experiment on the rivers that use to have alot of fish-no dams are on them.
See that they are stocked, and if the fish are allowed to come back to spawn!
The DUNGENESS-MORSECREEK, that use to have Chinookruns-THE QUILLAYUTE that is down to 2/3 to what it use to be, others

HALF the FISH What good is it going to do-destroying two beautifull lakes that have been in area over fifty years-replanting fish so that they can go up stream to spawn-when the dams are removed only to run into the **same sit[illegible]** gill netters at the mouth, and Indians with their **mile** of nets **catching** the fish trying to **go** to spawn (its their right and ceremonial right) so who's to say or stop them?)

SOCIETYS
What we don't understand either-IS WHY THE **WILDLIFE SOCIETYS** WANT THE TWO LAKES OUT? BOTH ARE **WETLAND, PROTECTED AREAS**-both have **DUCKS, SWANS AND FUR-BEARING ANIMALS**. IF THESE SOCIETYS DO HAVE THEIR WAY, THEN WHAT GOOD IS THE **WET-LAND LAW**?
THIS LAW SHOULD BE ABOLISHED-then property owners that have paid taxes for years can do what they want to with their own land!

ALSO **WILDLIFE SOCIETYS** SEEM TO BE BLOWING HOT THAN COLD. HOW ABOUT THE C.Z. (before DASHOWIA MILL) when they wanted to fill in a pond for chip storage, BUT A **SEATTLE BASED WILDLIFE SOCIETY** WOULDN'T LET THEM BECAUSE OF TWO **DUCKS** ! Whats going on!

Sincerely,

Mr & Mrs Donald R. Ford
Darlene A. Ford

Darlene A. Ford
Donald R. Ford

NOV 5 - [illegible]

6848 – 31st Avenue N.E., Seattle, WA 98115 • 525-7268

Oct 25, 1993

Dear Secretary Babbitt.

I applaud your concern regarding dam removal on the Elwha River. Please make this important project a priority. Sometimes it is difficult to make a difference on this earth. But you can. Thank you for your efforts →

OCT 27 1993

Sincerely,

Mary Jane Ferguson

Mary Jane Ferguson

385

Old growth forest devastation on the Olympic National Forest, Washington
The old growth forests of Washington, Oregon and California have been relentlessly logged. Over 90 percent of these once vast and complex ecosystems have been replaced by a wasteland of clearcuts, reduced to tree farms or lost forever to development. What little remains in our national forests must be permanently protected.
[illegible]

Honorable Secretary,

I urge you to implement and Fund the Elwha River Restoration Act for early removal of the dams to restore the fish and natural river system of the Elwha.

As long ago as 1950 we camped and fished along the banks of the Elwha. Time is running out for the fish to return.

Your wisdom and courage are crucial.

Sincerely,
Maurine Ryan

RECYCLED PAPER

349 S. Harrington Rd.
Coupeville, WA 98239

The Honorable Bruce
c/o Olympic National Park
600 E. Park Ave.
Port Angeles WA 98362

OCT 27 REC'D

Dear Mr Babbitt -

I want to express my interest in the removal of the dams blocking the Elwha River. Please move as swiftly as possible as I believe this valuable system needs to be restored. I urge you to support funding for dam removal and river restoration in the upcoming Administration appropriation requests.

Sincerely,
Stacy [illegible]
Phil [illegible]

340 Ravens Rd
Port Townsend, WA 98368

OCT 27 REC'D

Phyllis D. KAPLAN, Ph.D
526 First Avenue South
Ste 525
Seattle, WA 98104

October 27, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Mr. Babbitt

Thanks for the strong report on the restoration of the Elwha River Ecosystem. I agree with you that we need to remove the dams blocking the Elwha river, and that this option provides a great opportunity for restoring an invaluable ecosystem.

I hope you can make the ELWHA project a high priority in the Interior Department budget. Please include the necessary funds for dam removal and river restoration in the upcoming Administration appropriation requests. Should this action not come to fruition, please develop a definite action plan and timelines for its removal , and that of the Glines Canyon dam.

Sincerely,

Phyllis D. KAPLAN

386

THE REV. DR. JOHN R. VAN EENWYK
4440 Frontier Drive, S.E.
Olympia, Washington 98501

26 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362

Dear Mr. Babbitt:

Thank you very much for your excellent report on the restoration of the Elwha River ecosystem. As I also support the removal of the dams, I hope that we can now take advantage of this great opportunity to restore a priceless ecosystem. I hope that you will be able to implement this plan with dispatch, as even now the ecosystem is in a crisis state.

I trust that you will be able develop a definitive plan for action and a timeline for removal of both the Elwha and Glines Canyon dams. Furthermore, I support making this project a high priority item in the Interior Department budget, and I give my vote for including funds for dam removal and river restoration in upcoming Clinton Administration appropriation requests.

Finally, as a clergyman in the Episcopal Church, I believe that it makes sense to tithe, that is, to give back to God ten percent of that which has been given to us. I understand that old growth forests now represent about 10% of the original forests in the United States. I urge you to tithe these forests, that is, to see that they are unmolested, so that God can continue to develop them in a manner that can serve as a guide to all humankind.

Very truly yours,

John R. Van Eenwyk

cc: President William Clinton
Senator Patty Murray
Senator Slade Gorton
Representative Jolene Unsoeld

OCT 28 REC'D

OCT 28 REC'D

286

11504 70th Ave. NW
Gig Harbor, WA 98332

October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Parks
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

I am most pleased that you have given your support for the Elwha River Restoration Plan. This is a most wonderful idea and needs to be implemented as soon as is possible. We need our salmon runs in this State restored quickly.

In addition, I feel that the scenic and recreational values that the Elwha River has to offer far outweigh the need for the two dams that now block its flow. It is my understanding that these two dams have a limited production of electric power and serve only special interests in Port Angeles. Please take all steps that you can to make the Elwha River Restoration Project a high priority for the Department of Interior. I am hopeful that adequate funding can be obtained as soon as is possible. Again, I thank you very much for your wonderful efforts regarding this project.

Yours truly,

Bobby Batey

Bobby Batey

OCT 28 RECD

Cygnie Freeland
5413 S Ellis Ave
Apt 3B
Chicago, IL 60615

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

To the Honorable Bruce Babbitt,

As voting citizen of Washington, I would like to thank you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the Elwha and Glines Canyon dams, and that this presents a great opportunity for restoring an invaluable ecosystem.

I would request that Department of the Interior move swiftly to implement the Elwha River Restoration plan as well as to:

1. make the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration approbations;
2. develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Once again, thank you,

Cygnie Freeland

Cygnie Freeland

OCT 28 RECD

To: Bruce Babbit
Secretary of Interior
600 E. Park Avenue
Port Angeles, WA 98362

From: Vernon Lee
10321 Arundel Avenue
Westminster, CA 92683
714-839-8109

Dear Sir,

Thanks for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring a invaluable ecosystem.

Being a nature enthusiast and a property owner on the peninsula, I would like to see preservation of all our rivers and forest. If you could focus on restoration of the great Dungeness River, which has even a greater need, in my opinion, you will realize just how much neglect and damage man has impacted nature, and our natural resources.

Concern Citizen,

Vernon Lee and family

OCT 28 RECD

10.27.93

THE HONORABLE BRUCE BABBITT
c/o OLYMPIC NATIONAL PARK
600 E. PARK AVE
PORT ANGELES WA 98362

DEAR MR BABBITT:

I AM WRITING TO URGE YOU TO FULLY REMOVE THE ELWHA & GLINES CANYON DAMS ON THE ELWHA RIVER. REMOVAL OF THESE DAMS IS A VITAL TOWARD RESTORING THE ELWHA salmon & steelhead.

THANK YOU FOR YOUR CONSIDERATION

SINCERELY,

Francis J. DiBiase
PO BOX 576
1905 B St
HOME WA 98349
(206) 884-5558

OCT 28 RECD

10/26/93
Mark Thurber
2609 Broadway East
Seattle, WA 98102

Secretary Bruce Babbitt
c/o ONP
600 E Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt,

I urge you to move swiftly in restoring the Elwah to it's former health by removing the Elwah dams. Please make the removal of the dams a priority in the Interior Dept. budget.

Sincerely,

Mark Thurber

OCT 28 REC'D

Lee First
2639 Beaver Creek Dr SW
Olympia, WA 98512

Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Mr. Babbitt;

Thank-you for the strong report on the Restoration of the Elwha River Ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

Please move swiftly to implement the Elwha River Restoration plan. The fish can not afford to wait any longer.

Please act to make the Elwha a high priority in the Interior Department budget. Please include enough funds to remove the dam and to restore the river in upcoming administration requests.

Please act to develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

Again, thanks for your report, and thanks in again for continuing to work on this important project.

Sincerely,
Lee First
Lee First

OCT 28 RE

Pearson
2233 N. Magnolia Ave
Chicago IL 60614

October 24, 1993

The Hon. Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Bruce Babbitt:

Thank you for supporting the restoration of the Elwha River ecosystem. I agree that we must remove the dams blocking the Elwha River, and I urge you to make it a high priority in the Interior Department budget.

Surely, some of the money that is currently being wasted on "defense" against a threat that has evaporated can be re-allocated to save the environment. After all, the military-industrial complex has done more than its share of creating the problem, and they continue to do.

Thank you very much.

Sincerely,

Theodore Pearson

OCT 28 1993

390

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24 October 1993

180 Summerside Dr.
Centralia, WA 98531

Dear Sec Bruce Babbitt,

I am writing in support of the Elwha River Restoration Project in which the 2 dams on the river would be removed to allow the return of the species of salmon formerly present there. It will be a unique and pilot project and will hopefully provide information and impetus to similar returns to natural ecosystems elsewhere.

Sincerely,

Wesley G. B. First
(206) 736-8950

OCT 28

391

Bruce Babbit

I agree that we must remove the dams blocking the Elwha River. We need to restore a very valuable ecosystem. Please develop a definite action plan & please include the funds needed for dam removal & river restoration in upcoming administration appropriation requests.

The fish & our ecosystem can't afford to wait any longer!

Thanks.

Honorable Bruce Babbit
c/o Olympic Nat. Park
600 E Park Ave
Port Angeles, WA
98362

OCT 28 RECD

391

October 28, 1993

Mark Ostersmith
3802 Burke Ave N.
Seattle WA 98103

Dear Secretary Babbit,

I am writing to voice my support for the removal of the Elwha dams in the Olympic National Park. I am thrilled to learn of your support for the restoration of this ecosystem, and hope that the removal of these dams can occur in the very near future.

I look forward to hearing that the removal of these dams will be a priority for the Interior Department, and that the funds will be allocated and a definitive time-line will be set.

Thank you for all of the hard work you are doing to ensure that the natural wonders of our country can stay that way for generations.

Sincerely,

Mark Ostersmith

OCT 28 RECD

391

27 Oct 93

Dear Secretary Babbitt:

Just to let you hear from yet another person in favor of removal of the Elwha dams. I have hiked in the Elwha River canyon many times and hope to see the day when fish runs are restored there.

Sincerely,

J. A. Kittrick
160 Osborn Rd
Port Angeles, WA 98362

OCT 29 RECD

---

26 October, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Dear Secretary Babbit:

I fully support the Department of Interior's decision that the removal of the Elwha and Glines Canyon dams is necessary to fully restore the riverine and riparian ecosystems within the eastern part of the Olympic National Park. I applaud your dedication to responsible ecosystem oriented management of our precious natural resource heritage, and look forward to the return of the salmon to the upper Elwha.

I am confident that you will continue to push for the funding needed to complete this project in a timely manner. Thank you for your work!

Sincerely yours,

Jill Silver
2213 Everett Avenue East
Seattle, WA 98102

OCT 29 RECD

5042 21st Ave NE.
Seattle WA 98105

Dear Mr. Babbitt,

I strongly support the finding of the draft report on the Elwha River, that removal of both dams is necessary for restoration of the anadromous fisheries on the river. Please make this ecosystem restoration project a priority - time is running out for Northwest fish species!

393

Thank-you

Martha Jackson.

Martha K. Jackson

I certainly support removing the dams from the Elwha,

We can no longer afford to destroy Natl wilderness.

As it lives I believe we also live better!

Thank You

Gary Paul
3530 Wallingford av N #6
Seattle, WA 98103

OCT 29 REC'D

OCT 29 REC'D

393

Dear Sec. Babbitt 10/25/93

I strongly support the Elwha River Restoration plan - let's move swiftly on it.

Let's develop a definite action plan & timeline for the removal of the Elwha & Glines Canyon dams -

Thanks.

Margie Noren
Sr. Delegate & member of the Sierra Club

OCT 29 RECD

MS MARGIE NOREN
[illegible] OYSTER BAY RD NW
OLYMPIA WA [illegible]

Minarets, Shadow Plateau, Eastern Sierra, California

Dear Mr. Babbitt

I thank you for your support of the proposal TO RESTORE The ELWHA RIVER By removing the 2 dams.

Please include funds needed for dam removal & river restoration in your appropriation requests.

The Sierra Club MOUNTAIN LIGHT Postcard Collection
Copyright © 1986 by Galen Rowell/Mountain Light, Inc.

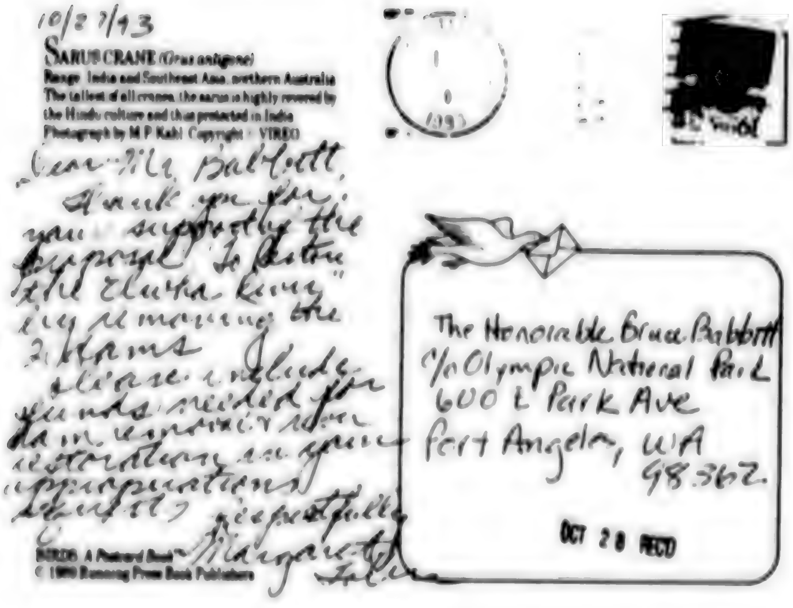
SEATTLE WA 981
PM
1
93

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave.
Port Angeles, WA
98362

Sincerely, yours

Terry Bush
Seattle

OCT 29 RECD



10/27/93

SARUS CRANE (Grus antigone)
Range: India and Southeast Asia, northern Australia. The tallest of all cranes, the sarus is highly revered by the Hindu culture and thus protected in India. Photograph by M.P. Kahl. Copyright © VIREO

Dear Mr. Babbitt,
Thank you for your supporting the proposal "To Restore the Elwha River" by removing the 2 dams. Please include funds needed for dam removal river restoration in your appropriations request.
Respectfully,
Margaret

BIRDS: A Postcard Book™
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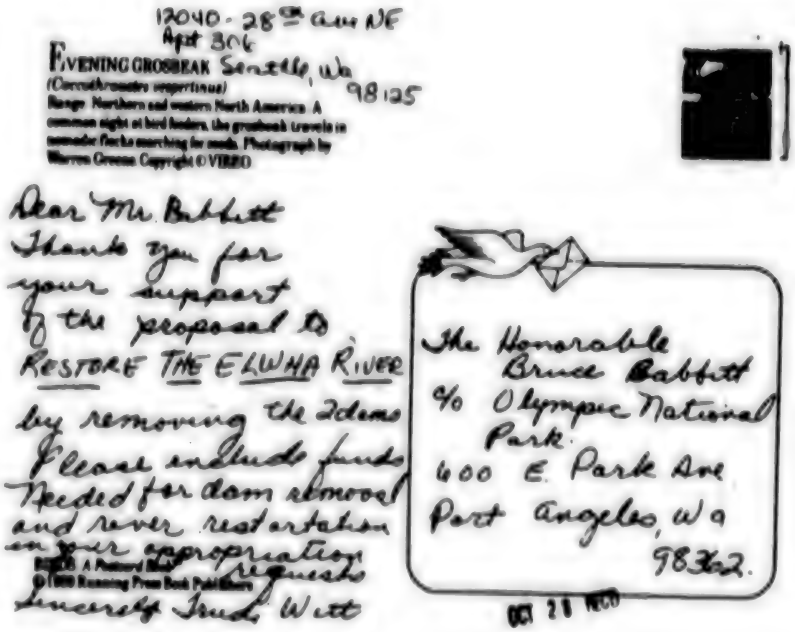
1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA
98362.

OCT 28 RECD



12040 - 28th ave NE
Apt 306
Seattle, Wa
98125

EVENING GROSBEAK
(Coccothraustes vespertinus)
Range: Northern and western North America. A common sight at bird feeders, the grosbeak travels in nomadic flocks searching for seeds. Photograph by Warren Greene. Copyright © VIREO

Dear Mr. Babbitt
Thanks you for your support of the proposal to RESTORE THE ELWHA RIVER by removing the 2 dams. Please include funds needed for dam removal and river restoration in your appropriation requests
Sincerely Trudi Witt

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© 1990 Running Press Book Publishers

The Honorable
Bruce Babbitt
c/o Olympic National
Park
600 E. Park Ave
Port Angeles, Wa
98362.

OCT 28 RECD

Dear Mr Babbitt —
I thank you for your support of the proposal to Restore the Elwha River by removing the two Dams. Please include funds needed for DAM removal and river restoration in your appropriation requests.
Angela Salazar POB 13132
Burton WA 98013

The Honorable
Bruce Babbitt
c/o Olympic National Park/Forest
600 E Park Ave
Port Angeles
WA 98362

OCT 28 RECD

The Mountaineers
300 Third Avenue West • Seattle Washington 98119 • (206) 284 6310
BRANCHES IN TACOMA, EVERETT, OLYMPIA AND BELLINGHAM

RECEIVED
MAILROOM
93 NOV -1 PM 2:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

October 27, 1993

Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Re: Elwha River Restoration

Dear Secretary Babbitt:

The Mountaineers is the oldest and one of the largest outdoor and environmental organizations in the state of Washington, with more than 14,000 members. Our first club outing was up the Elwha River in 1907. Since that time the club has maintained a strong interest in the Olympic Peninsula, Olympic National Park, and protection of rivers and fisheries habitat.

The Mountaineers is delighted that the Department of the Interior has prepared a report recommending the removal of both the Elwha and Glines Canyon dams to fully restore the Elwha ecosystem and native anadromous fisheries stocks. The Mountaineers and other environmental organizations have supported this position for years. We agree with you that the Elwha river presents "an enormous opportunity" for ecosystem restoration.

We urge you to submit the final report to Congress as provided by law. More importantly, we urge the administration to provide full funding for the restoration program in the upcoming budget. Not only will the restoration project rehabilitate this magnificent ecosystem, it will also be a substantial source of jobs for displaced timber workers.

Thank you again for your critical leadership on this important issue.

Sincerely,

THE MOUNTAINEERS

Don Heck

Don Heck
President

DH:wbr

TO EXPLORE STUDY PRESERVE AND ENJOY THE NATURAL BEAUTY OF THE NORTHWEST

NOV - 1 RE

OLYMPIC
RIVERS
COUNCIL
[illegible]

October 23, 1993

Dr. Brian Winter
Elwha Restoration Interagency Team
NMFS
7600 Sand Point Way NE
Seattle, WA 98115

REGARDING: COMMENTS ON THE PUBLIC REVIEW DRAFT OF THE ELWHA REPORT

Dr. Winter—

Thanks for hosting the Public Workshop last week in Port Angeles. After reading The Elwha Report, your individual experts were very helpful in answering the few questions we had about the Elwha restoration plans.

We were sorry that you and the other experts stationed at the Workshop took what we felt was an unfair hammering from the 'R.E.A.L.' coalition. We hope the efforts of this new coalition do not hinder the progress and funding of the Elwha restoration.

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—CONGRATULATIONS ON A FINE REPORT!!! The content of the Report is sensible and straightforward. It is easy to read, and the photos and graphics are an interesting bonus.

We offer only a few comments:

**Again, we agree with the findings of your Report, and the sooner the dams come out, the better!

**Our only major disappointment in the Report is that a 'definite plan' for restoration of the Elwha is not recommended. Four options for dam removal are outlined, and nine different options for sediment management are outlined, leaving the selection of a 'definite plan' on the shoulders of an EIS at a later date. The 'later date' is the part that bothers us—isn't time of the essence here?

**Page 89: Average Monthly maximum August cfs SHOULD read 1941?

**Page 148, Appendix II: 'Initiate aggressive control program of exotic plants.' At the public workshop, Mr. Schreiner with the 'Habitat Restoration' section assured us that this meant mechanical, non-chemical control. It would be re-assuring to see that stated in the Report.

**Appendix I is confusing. In those six pages duplication is so extreme that the whole thing could be better stated in three pages.

**Page 168, Appendix I, next to last paragraph: Tribal forestry management will emphasize 'a sustainable yearly income over long-term rotations.' —YIKES!! This statement reeks of the 'clearcut-and-run' mentality of the 1980s. It makes no sense to restore the pristine upper watershed of the Elwha at the same time we tolerate downstream logging.

You have produced a fine document. We hope it quickly leads to action on removal of the dams and restoration of the Elwha!

Carol Volk, D.V.M.
Chair, ORC Steering Committee

Fastest Address: 4830 Geiger Road
Port Orchard, WA 98366
(206) 876-6780

copies: Shawn Cantrell
ORC Steering Committee members

NOV 2 1 1993

397

RECEIVED
MAILROOM
93 NOV -1 PM 2:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

Dear Mr Babbitt;

As a resident of Washington and also as a citizen of this globe, I would strongly urge you to support the removal of both dams on the Elwha River

I know that you, as well as I, am committed to the preservation and restoration of America's river ecosystems.

Please act swiftly in that valuable time is being lost to [illegible] Salmon stocks which have a great chance of returning if we hurry!

In its own way, the Elwha is every bit as spectacular and important as the Colorado River is, in your former state.

Please act swiftly and responsibly to save our cherished land.

Thank-you
Ed Schmidt
14272 NW Dolly Varden Ln
Bremerton, WA
98312

NOV - 1 1993

RECEIVED
MAILROOM
93 NOV -1 PM 2:53
OLYMPIC NATIONAL PARK
PORT ANGELES, WA 98362

10-14-93

Dear Mr. Babbitt,

Remove the Elwha Dams!!!
I live in Washington and have Rafted the river many times.
It is important that these 2 dams are removed so that the Ecosystem is Restored.

Thank You,
Carrie [illegible]
632 Washington Ave. Apt B
Bremerton, WA 98310

NOV - 1 REC'D

121 Ridgetop Place
Sequim, WA 98382
10/6/93

Brian Winter
Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Gentlemen

W399

In response to your request for comments on removing the Elwha Dams I'm interested in knowing whether or not you have included in your cost the cost of the lost revenues & the additional cost to the consumer of replacing the energy (power) with another more costly & polluting fuel? The balance of trade should also be considered.

In addition, can you explain why streams that don't have dams have also had the problems with small numbers of salmon returning. In Anchorage, the dogs & cats have polluted the streams and killed the fish runs. Will that, or has that happened here? Dams aren't the sole cause for the fish not coming back.

10/12/93

Foreign countries & fishermen are contributing to the decline. So once the dam is removed are you sure the fish will return with the numbers you are expecting or wanting?

Would it be cheaper to raise fish (fish farms) like other countries do rather than spending billions (and millions) on something that may not even work.

Hopefully, some of these questions will be answered honestly before the billions are actually spent destroying a useful dam.

Thank you

Jerry Congs
Jerry Congs

400

RECEIVED
MAILROOM
[illegible]
OLYMPIC NATIONAL PARK
PORT ANGELES WA 98362

Oct. 27

Dear Mr. Secretary:

Thanks for your strong support of the restoration of the Elwha River ecosystem.

I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoring an invaluable ecosystem.

Sincerely,

Jordan Pollack

Jordan Pollack
1222 Blaine St.
Port Townsend
WA. 98368

NOV -1 REC'D

October 30, 1993

Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, Wa 98362

Dear Secretary Babbitt:

Thank you for your report on the Restoration of the Elwha River Ecosystem. Yes we must remove the Elwha River dams in order to restore an invaluable ecosystem.

Please act swiftly to implement the Elwha River Restoration plan, and make the Elwha a high priority in your budget. Please include appropriation request funds for dam removal and river restoration.

Finally, please establish an action plan and deadline for removal of the Elwha and Glines Canyon dams. Thank you!

Tim McGuigan

Tim McGuigan
2316 Yale Ave E #102
Seattle WA 98102

F 11/3/93

400

October 28, 1993

The Honorable Bruce Babbitt;

Thank you so much for the enlightening and strong report on the Restoration of the Elwha River and the ecosystem involved!

We are Washington natives who love our natural heritage and we agree with you that the dams blocking the Elwha must be removed in order to restore this priceless ecosystem and return our fish to the river!

We urge you to move forward quickly as time is running out for the fish! We are behind you all the way!

Sincerely,

Cheryl Allen

Ron Allen

Ron & Cheryl Allen
25715 50th Ave. East
Graham, Wash. 98338

(206) 847-9232

Oct. 31, 1993

Secretary Babbitt,

Thanks for the strong support on the restoration of the Elwha river ecosystem. I agree with you that we must remove the dams blocking the Elwha River, and that this presents a great opportunity for restoration of an invaluable ecosystem.

Please make this a high priority consideration.

Michael Hill
P.O. Box 823
Elbe, Wa. 98330

F 11/2/93

401

OCT 25 93

HONORABLE BRUCE BABBIT
OLYMPIC NATIONAL PARK

DEAR SIR —

PLEASE NOTE MY NAME IN COMPLETE AGREEMENT WITH THE NOTION OF REMOVING THE ELWHA DAMS AND TRYING TO MITIGATE THE DAMAGE ITS DONE.

WOULD YOU PLEASE SEND THE DEPT OF INTERIORS REPORT. ALSO ANY REPORTS FROM OLYMPIC NAT'L. PARK.

THANKYOU

BRAD PINKERTON
MONUMENTAL CREEK
HC 83
CASCADE IDAHO 83611

402

OCT 29 RECD

October 22, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 East Park Ave.
Port Angeles, WA 98362

Dear Secretary Babbitt:

Thank you for your strong report on the restoration of the Elwha River Ecosystem! I have spent the better part of my adult life living next to or hiking along the mighty Elwha River. I agree with you that we must remove the dams blocking this wonderful wilderness river and restore it's mythic salmon runs.

I implore you to move swiftly to implement the Elwha River Restoration Plan and do everything in you power to make the Elwha a high priority in the Interior Department budget.

Most Sincerely:

[illegible] Welsh
1510 East Mercer
Seattle, WA 98112

NOV 3 - RECD

402

Marian G. Graham
6103 Skyline Blvd
Hillsborough, Calif 94010

10/24/93

Secretary of Interior
George Babbitt

Dear Sir:

My husband and I strongly support the removal of the Elwha dams. Please move swiftly to do this by making the Elwha a high priority in the Interior Department budget. Please include the funds needed for dam removal and river restoration in upcoming Administration appropriation requests.

Please develop a definite action plan and timeline for the removal of the Elwha and Glines Canyon dams.

We would like to see some action on this. So far the promise of a Democratic government has fizzled out!

Sincerely yours,
Dr. and Mrs. John Graham

NOV 3 - RECD

James De Leo
Box 1166
Port Townsend,Wa.,983
October 21,1993

United States Department of Interior

National Park Service
600 East Park Avenue
Port Angeles, Wa.,98362

Dr. Brian D. Winter, Team Leader
Elwha Restoration Team

Dear Sir:

I am 71 years old. I have seen a lot of fly by night projects come and go as to government spending and waste, but this takes the cake. This has to be right along with sending troops to the mid east to stop the fighting that has been going before Christ.

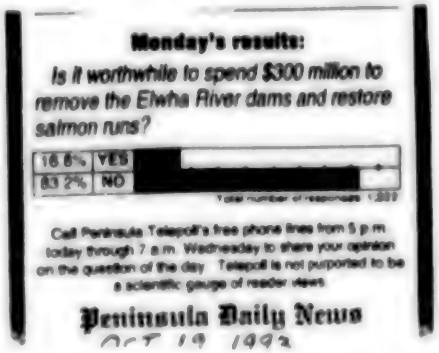
Why don't the tree huggers just come out and say "Paper Mills Leave Town". If the dams are removed and cheap power and water is not available this is just what will happen. They are fighting now to stay in business with high raw material costs and removing the dams will really be the end of hundreds of jobs and great loss in property taxes.

Restoring the salmon run is just a front. We have hundreds of streams on the peninsula now that could be re-stocked with all kinds of salmon. Why the Elwha. Will the Indians fish with spears as they did back when it was an open river or will they use nets. Will the Indians be able to hunt down the seals as they did years ago to protect the run. On both questions I think not.

There are so many more priorities for government spending than removing the dams, let's just forget the whole thing before millions more dollars are wasted doing surveys. There must be another worthwhile project you could be working on.

Please note below. Telephone poll conducted by the local press.
I'd say your project of government waste is not to popular in our area.

Jim



Monday's results:

Is it worthwhile to spend $300 million to remove the Elwha River dams and restore salmon runs?

16.8%	YES	
83.2%	NO	

Total number of responses [illegible]

Call Peninsula Telepoll's free phone lines from 5 p.m. today through 7 a.m. Wednesday to share your opinion on the question of the day. Telepoll is not purported to be a scientific gauge of reader views.

Peninsula Daily News

OCT 19 1993

OCT 2 1 REC

Rivers Council of Washington
1731 Westlake Avenue N., Suite 202
Seattle, WA 98109-3043
206-283-4988

October 27, 1993

Dr. Brian Winter
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

RE: Comments on Public Review Draft on Elwha Dam Removals Pursuant to PL 102-495

Dear Dr. Winter:

Rivers Council of Washington and I thank you for this opportunity to comment on the public review draft assembled pursuant to PL 102-495. Before listing our comments and questions for consideration in the final draft of the Elwha Report, I want to express my personal (and my organization's) gratitude for your hosting of the workshop at Port Angeles High School on October 18th. As one who is frequently involved in the dam licensing and relicensing game, I have witnessed all too many occasions where members of the general public have been all but excluded from the decision-making process. This was not the case at the Port Angeles meeting. In fact, I was particularly happy to see so many local residents at the meeting. They are surely to be most affected by any decision that is made regarding the dams. Their large turnout is a tribute to you and your staff's efforts at giving public notice and I hope you will take their concerns into account when finalizing the report.

404

The following are the Rivers Council of Washington's comments to the draft Elwha Report.

I. Recreational Opportunities.

After a thorough reading of the draft report, we at Rivers Council are convinced that there is a significant gap with regards to recreational opportunities that may be added or lost if the dams were to be removed. The two paragraphs on pages 41-42 of the report note that sportsfishing, hiking, mountain biking and whitewater boating opportunities would increase as a result of dam removal. Nevertheless, needed details as to the where's and how's are omitted entirely. In addition, even this small section omitted the mention of increased opportunities for overnight camping in the area. This is unacceptable.

The Elwha River is already considered a terrific recreational resource for outdoor enthusiasts.[1] The removal of the dams may have an adverse affect on some current recreational uses (e.g., motor and flat-water boating on Lakes Aldwell and Mills).[2] Removal would also increase recreational opportunities however. These new opportunities (as well as those lost) should be factored in if a cost-benefit analysis of the project is to be adequately done.

FERC itself is beginning to take instream and river corridor recreational opportunities into account in its licensing decisions. For example, FERC recently required the City of Tacoma to hold a test run of the LaGrande bypass reach on the Nisqually River for the express purpose of finding whether that section is "runnable" by whitewater enthusiasts. While such a test would not be possible in the context of the Elwha dams until removal, it indicates that recreational opportunities do and should continue to play a large role in decision making within the public interest. The final Elwha draft should reflect this fact.

More specifically, in reference to increased whitewater boating opportunities, the final report should adequately address the following issues:

1) Is there sufficient gradient in the now inundated areas of the river to allow for the formation of rapids once the dams are removed?
2) Along the same lines, does the hydrology of the now inundated areas of the river make one or more new whitewater boating runs feasible? If so, what class rapids (I-VI) might appear once the lakes disappear?
3) What will be the hydrologic effect of each of the four alternatives for dealing with sediment build up in the lakes (removal, reconstruction, erosion, combination)? Will one alternative be more conducive to the creation of a whitewater run(s) on the river? If so, which one(s)?
4) If there would indeed be one or more possible whitewater runs on the river, what is the character of access to those runs (e.g., trails, roads, etc.)? If any, who

OCT 29 RECD

404

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[1] See Douglass A. North, Washington Whitewater: The 34 Best Whitewater Rivers, 64-67 (The Mountaineers, 1992)(containing full description of Altaire Creek Campground to Highway 101 section); Jeff Bennett, A Guide to the Whitewater Rivers of Washington, 260 (Swiftwater Publishing Co., 1991).

[2] Interestingly, my conversations with a restoration biologist employed by the tribe indicate that, on Lake Aldwell at least, there seems to be very little in the way of recreationalist use of the lake. This should be looked into so that what is lost by dam removal can be adequately assessed.

would administer those access points?

In order to fully answer the question in point 4 (above) and to address the character of other recreational enhancements in the area (fishing, hiking, biking, overnight camping, etc), much more should be included in the report as to how and by whom the newly restored lands would be administered once the dams were removed. From my conversations at the workshop, it did not seem as though anyone had a clue. Most thought that it would be jointly administered by the tribe and some other government entity. No one offered how this would be carried out although some suggested managing the area as a wildlife preserve (again without going into detail). Clearly, this is not enough information with which policy makers can make a reasoned opinion in the public interest!

2. Water Quality Concerns.

Rivers Council also remains concerned over possible degradations in water quality as a result of dam removal that is poorly planned or executed. This may occur if sediment behind the dams is not repositioned or disposed of in a responsible matter. Under this scenario, the level of Total Suspended Solids may rise.

This is not only a question of aesthetics. The health of the river ecosystem (including salmonids) as well as that of local residents would be at risk if these degradations were to occur even temporarily. As such, the final report should adequately address what will happen to the TSS levels of the Elwha River under the different scenarios. If disposal outside the Elwha basin is contemplated, this analysis should also be done for the river system in which the sediment may be disposed of. In both cases, this should be done in contemplation of the average flow of the river (1,507 cfs for the Elwha) as well as of flood-level flows.

3. Flooding.

With regards to the reconstruction of the banks in the now inundated areas (see diagram draft Elwha Report p.81), the final Elwha report should adequately address the probability that revegetation of those areas will not protect the newly formed banks from floods that occur soon after dam removal. This erosion would no doubt have an effect on water quality downstream, as well as the opportunities for stream-side recreation. As a consequence, much more detail is needed in the way of the following:

1) What flora will be planted in these areas?
2) How soon after planting could the root systems of these flora be expected to be able to retain the newly placed sediment?
3) What is the probability that damagingly high flows could

hit those banks in the interim period? If such probability is significant, what measures can be taken to protect the banks from flood damage?

4. Planning.

While it is clear that dam removal on this scale is a monumental task, specifics are needed in the area of removal schedules and costs. Again, these are crucial if a well-reasoned decision is to be debated and made.

5. Alternative Power Sources Availability.

When considering the availability of alternative power sources after dam removal (p.42), the draft report failed to mention the conservation alternative. While PL 102-495 provides Daishowa America with replacement power from the Bonneville Power Administration, this does not mean that conservation should not be at least mentionned in the final report as an alternative to cutting perceived higher operations costs associated with the BPA alternative.

6. General.

Overall, the members, volunteers and staff of the Rivers Council of Washington strongly support the dam removal option as described in the draft Elwha Report. It will serve to best restore an ecosystem ravaged by 80 years of irresponsible engineering. It is also the only way to save the dwindling number of salmonids that has made this riverine resource famous. Removal is also compatible with the United States' treaty and trust obligations to the S'Kallam Tribe. Finally, restoration will serve to increase recreational opportunities in the Elwha basin which could in turn benefit the economies of Port Angeles and the surrounding area.

However, if dam removal is ever going to be looked upon as a viable and beneficial alternative, the Elwha story must be carefully written. Congress commanded the Secretary of Interior to begin by studying the issue. This must be done quickly but in a responsible manner so that the next phase -- decision-making -- can be made in the public interest.

Thank you very much for this opportunity to voice our opinions regarding the Elwha in writing. Please feel free to contact me at the address below if you have any questions. Rivers Council staff remain grateful for the opportunity to participate in the discussion and we look forward to the opportunity to examine the final report.

Sincerely,

Brooke A. Martic
Hydropower Coordinator
Rivers Council of Washington

406

3148 Laurel Road
Longview, WA 98632-5551
(206) 423-4658

31 October 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Mr Babbitt

We commend you for your support of the restoration of the Elwha River Ecosystem

We trust that you will make the Elwha a high budget priority, including funds needed for dam removal and river restoration

To preclude shelving, we trust that you will develop an action plan and time-line for removal of the Elwha and Glines Canyon dams

Sincerely yours,

Ruth Deery
Harold Deery

406

Dear Sir

You have my complete support to proceed as soon as possible to remove the Elwha dams

Sincerely

Jim DeNio

N16226 Sands Rd
Mead, WA 99021

NOV 3 - RECD

To: Honorable Bruce Babbit
C/O Olympic National Park
600 E. Park Ave.
Port Angeles, WA. 98362

From: Pete Wyman
N 16702 Dartford Dr.
Spokane, WA. 99208

Subject: Removal of the Elwha dams in Washington State.

Commercial and sports fishing for the Pacific Salmon is a multi million dollar industry that has greatly suffered from dam building in Washington State. I urge prompt attention be given to removal of the Elwha and Glines Canyon dams and for tedral funds for implementing the plan. We must not allow delay to destroy the remainder of the Elhwa anadromous fish runs.

Some may say that the salmon is extinct in the river because of the dams. However, not 100% of all the salmon ever returned to the exact same spawning stream. About 15% of a river's fish stray to other streams in the river. Therefore, there is no reason biologically why a salmon cannot return up the 75 miles of former spawning grounds over time.

Thank you for your attention.

Pete Wyman

Pete Wyman

OCT 25 RECD

To: Brian Winter
Re - Elwha report

10/21/93

From: Edwin Johnson
312 E. 12th st.
Port Angeles, Wash.

Dear Mr. Winter:

I attended the workshop at Port Angeles High School library but did not make any comments. After reading part of the report, I now have some comments.

For one thing, Ediz Hook was never fed by the cliffs very much. They are mostly dirt and clay. Practically all of the hook's material was sand and gravel from the river. Evidence in the FERC DEIS helps back up my statement.

I think your cost estimates are too high and timing goals are too slow. In the different plans of the condensed version, the cost for water quality is always $17,150,000, while the cost for dam removal and sediment management varies from $66,700,000 to $226,210,000. It seems to me that the more money spent on sediment retention, the less money would have to be spent on water quality. Besides, Lake Mills is so full of silt that the Elwha is often silty below the lake when the upper Elwha and other rivers are clear. Our city and mill water systems adequately deal with these sediment conditions. Of course, the Lake Mills sediment problem will get worse if the dams are left in place. With adequate sediment management during dam removal there should be no need for spending money on water quality.

Volunteers spent money and put in many hours over the years trying to get rid of the dams. If it wasn't for volunteers communicating with the FERC, Park Service, other agencies, and Congress, and causing the threat of a court battle, the Elwha Act wouldn't have gone through, the dams would be licensed another long period, and you people wouldn't have the jobs you have writing this report.

I think you are in danger of blowing the whole thing by adding 10's of millions in unnecessary cost and years of unnecessary delay. This could make us lose the battle at the last moment. If this happened, all our donated time and money would be for nothing.

For example, it might be a big mistake to wait until 1998 to acquire the dams. There is no guarantee of Clinton's reelection in 1996. What if we get another Lujan or James Watt as Secretary of the Interior? We'd better acquire these dams and start the removal process before 1996, or the right wingers could snatch it away from us or at least delay it out past the point of extinction of the remaining stocks of salmon needed to successfully reproduce on their own in the Elwha watershed.

In the process of acquiring money for dam removal the initial acquisition of money should include dam acquisition, dam removal, and sediment management. I think it is a mistake to try to acquire money for fish restoration, habitat restoration, and more studies at the same time. After all, the act of dam removal itself is an act of fish and habitat restoration, because it would enable fish to begin restoring themselves.

I think you owe it to us, the volunteers and taxpayer to get the dams out as quickly and cheaply as possible. Proposals on many of your other expenses can wait until after dam removal, if it ever happens.

Sincerely:

Edwin R. Johnson

you in
PS Glad that Interior Dept. recognize
the importance of the Elwha and
that dam destruction is the
only way to adequately restore
the ecosystem.

OCT 22

From: Edwin Johnson
312 E. 12th st.
Port angeles, Wash.
98362

October 16, 1993

To: The Honorable Bruce Babitt, Secretary of the [illegible]

RECEIVED
MAIL ROOM
93 OCT 20 AM 11:48

Dear Secretary Babitt:

I was born in Port Angeles in 1945. I've lived here most of my life. In the 50's 60's and 70's the Elwha behaved [illegible] when it was turbid or clear. In 1978 I moved out of [illegible] back in 1987, I noticed many times the Elwha was cloudy even though it hadn't rained for a long time and other rivers were clear, so one day in October when the river was cloudy after a prolonged dry spell, I hiked up the Elwha trail and down into the canyon a couple miles above Lake Mills. Up there, the river was clear. After all these years Lake Mills is now so full of silt that now all they have to do is draw the lake down some and the river clouds up. Without the dams the river would have more days of clear water than it has now.

Our city water and mill water systems handle the current cloudy water conditions, and I think the systems could continue to provide us with good water if the dams were taken out. I don't think there would be any need to spend money on our water systems because of dam removal, especially if the dam removal process held back most of the sand and silt in the lakes.

I am in favor of dam removal and am glad your report agrees with me. There's no way you can throw money at a watershed and get fish production like you can in a watershed where 90% of it is in old growth forest.

I hope money is available soon for dam removal. If California can build a freeway at a cost of 100 million per mile, which is what I heard on the news about their newest freeway, the government should be able to spend 100 million to take out the Elwha dams.

Sincerely:

Edwin R. Johnson

PS In your Elwha report on page 10 it talks about the
pipeline on the sea cliffs causing some erosion of Ediz
Hook. Most of Ediz Hook erosion came from the dams
because they blocked the settleable sand and gravel
from the river. The sea cliffs provided very little
as ~~they~~ it is made of mostly dirt and clay which
doesn't ~~[illegible]~~ settle easily. Before all the big rocks
were added, the spit was made up of sand and
rocks which came from the river after slowly moving
on for decades. If the dams remain will probably
be turned to an island because there
may eventually be few [illegible] drop off to [illegible] rocks

Thursday 14 October1993

To: Dr. Winter, Team Leader
Elwha Restoration Interagency Team

We are property owners of approximatly five acres of land at a location known as "The Place" which adjoins the mouth of the Elwha River on its westerly side. Based on this fact and historical experience we've had at this location our interest and concern regarding the dam removal project is substantial and ongoing. As a result of this interest we have reviewed your report mandated by the Elwha River Ecosystem and Fisheries Restoration Act (PL 102-495).

In addition to the foregoing we have communicated on two occasions with our Representative Norm Dicks regarding our concern that the act did not specifically call attention to the need for the report to address the flood control needs of the area impacted by the river. In his response of April 20 1993 he assures us that flood control is a legitimate issue that must be addressed in the Secretarys' plan for dam removal.

As a result of the foregoing, our current concerns and questions can be summarized as follows in our reaction to your Public Review Draft and its contents:

First of all we would like to commend the Congress and the interagency team on the worthwhile nature of this entire undertaking. It is long overdue and will mark a historic step forward for the Olympic Peninsula. We are willing and anxious to assist in any appropriate fashion to see the project achieve reality.

The first significant comments in the report relating to our concern appear on page 35 in the first and fourth paragraphs as follows ---- " Channel flood levels for the 200-year recurrence interval flood would be 1 to 2 feet higher along the lower Elwha levee. The levee would need to be raised about 4 feet and be armored with larger riprap to maintain present flood protection and levee freeboard."---- and further with dam removal ---- "High frequency floods would no longer be attenuated by the reservoirs resulting in higher water surface elevations during high frequency flood events." ---

These statements appear to reflect a recognition of the need to substantially increase the flood protection function of the lower Elwha levees without any specific mention of the west side levee.

We are encouraged by the inclusion on page 64 of one item in the list of potential liabilities or obligations ---- " #13 Increased flood potential " This appears to give recognition to the need for additional flood protection for the entire project and not just one side of the river, at least we hope so.

Regarding the discussions on pages 87 88 and 89 about ----"The annual discharge pattern of the Elwha river is influenced by-----" It may help to expand this impact research to include two additional factors. The large influence of the tidal action and severe at sea storms. These two factors do result in substantial escallation of the river flooding thereby raising the need for increased levee protection at certain times.

Two significant references to flood control protection appear on pages 93 and 96. These statements are: Page 93 ----" 4. The U. S. Army Corps of Engineers built Lower Elwha Levee extends from about RM 0.4 to about RM 2.9. The levee has a 12 foot wide crest, af 45 foot bottom width, and is about 8 feet high. It is designed to be 3 feet above the current 200-year flood level." Page 96-----"Lower Elwha Levee - Initial estimates indicate that the levee should be raised 4 feet to maintain the existing flood control protection if the dams are removed. In addition, the quarry spalls protecting the face of the levee would need to be augmented with larger diameter rip rap. Initial estimates suggest that at least 18 inches of large diameter riprap should be added to these existing quarry spalls. Preliminary evaluations suggest that the capital cost of these levee improvements would total $2.1 million (April 1992 price level). Annual operation and maintenance costs associated with the levee enhancements are likely to be comparable to those for the current levee."

Since the Total Project cost summaries in tables 13,14 and 15 each list the 2.1m estimate for levee modifications we have reached the following conclusions: The report appears to have conducted no detailed research on the existing west side levee,giving the impression that it does not recognize its existence, and certainly contains no funding recomendation regarding levee modifications beyond those relating to the east side levee. The report fails to deal with the obvious fact that the river does indeed have two sides and inadequate attention has been addressed to this situation.

Assuming the west side inhabitants are entitled to equal protection , their levee should be improved to the same integrity level as the east side levee. Further, the west side levee should be given the same funding status as the east side. This would result in an (at least) addition of 2.1m in the levee modification category of the various costs summaries.

If the Federal Government does decide to proceed with the dam removal project we strongly feel that the entire cost of the proposal must be borne by the Government and no liability (financial or otherwise) should be incurred by any of the downstream landholders.

This document represents our input to the meeting currently scheduled for Port Angeles on Nov. 18th. We would like to respectfully request a response in written form and that the content of this paper be entered in its entirety into the official record of that meeting.

Thank you for your interest and assistance.

Bruce F. Brennan

Bruce F. BRENNAN
1920 Place Road
Port Angeles, WA. 98362

Marian E. BRENNAN
1920 Place Rd.
Port Angeles, WA. 98362

We concur with above concern about flooding endangering our property and ultimate liability documentation.

Dr. Gus Ormbrek
1922 Place Road

Monell Ormbrek

Monell Ormbrek
1922 Place Road

Our property at 1916 Place Road sits at the mouth of the Elwha River. We are very supportive of the dam removal. The restoration of the Elwha River habitat is important to the entire community. However, we share the concerns for proper flood control measures as expressed in this letter and we also share community concerns over Port Angeles water supply and quality when the dams are removed. We also want to be sure that proper methods are employed in sediment removal.

Malcolm Dudley

Malcolm Dudley
1916 Place Road

Cosette Dudley
1916 Place Road

Gladys Dudley

Gladys Dudley
1916 Place Road

10/18/93

Sierra Club
Columbia Basin Field Office
Route 2, Box 303-A
Pullman, WA 99163

(509) 332-5173
FAX: (509) 332-5173

November 8, 1993

Hon. Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 East Park Ave.
Port Angeles, WA 98362

411

RE: The Elwha Report

Dear Mr. Secretary:

It is my personal pleasure to comment on the public review draft of *The Elwha Report: Restoration of the Elwha River Ecosystem and Native Anadromous Fisheries* - because, in July, 1991 while I was then a staffer for Friends of the Earth, you and I had the opportunity during the National Rivers Conference in Denver to discuss restoration of the Elwha watershed and salmon runs. Long before the Congress enacted P.L. 102-495 and before your appointment as Secretary of the Interior, you demonstrated both expertise on, and enthusiasm for, this effort to restore a premier anadromous fishery, a beautiful river, and a unique national park.

This report prepared by the Interior Department agencies, the National Marine Fisheries Service, and the Lower Elwha S'Klallam Tribe thoroughly and convincingly makes its case that the only way to restore the salmon and ocean-migrating trout runs as well as the Elwha ecosystem itself is to remove the Glines Canyon and Elwha hydroelectric dams. I would respectfully urge you to accept this general conclusion and its supporting documentation in the report.

In addition, I would respectfully urge you and the Interior Department agencies to move aggressively to develop a specific engineering plan for the dams' removal on as short a timeline as technically feasible. The pink salmon - once so numerous that they lifted canoes out of the water - have declined to the point of easily qualifying for protection under the Endangered Species Act. The other fish stocks are also precariously close to extinction. Therefore, for this restoration effort to succeed, the federal government and your department must act quickly.

411

Moreover, with the passage of time, the Congress can only find it more and more difficult to appropriate the funds necessary to carry out the dams' removal and the watershed restoration. I would respectfully urge you to make the Elwha restoration a top priority in budget-setting for the Interior Department, and to include Elwha funding in the administration's appropriations requests.

Attached in memorandum form please find a critique of the analysis in the report regarding impacts on regional power supply.

As you know, restoration of the Elwha watershed represents not only a once-in-a-lifetime demonstration project of wild salmon recovery, but a vivid case study of the interdependence of environmental and economic health. If we continue to move swiftly, Port Angeles can look forward to the win-win solution of both jobs in the local community and fish in the local river.

In closing, I would commend your department's agencies, the National Marine Fisheries Service, and the Lower Elwha S'Klallam Tribe for their very hard and good work in preparing *The Elwha Report*, and would urge them to keep up the good work harder and faster. Thank you very much for this opportunity to comment on the report.

Sincerely,

James M Baker

Jim Baker
Northwest Salmon Campaign Coordinator
Sierra Club

Attachment

TO: National Park Service (Department of the Interior)
U.S. Fish and Wildlife Service (Department of the Interior)
Bureau of Reclamation (Department of the Interior)
Bureau of Indian Affairs (Department of the Interior)
National Marine Fisheries Service (Department of Commerce)
Lower Elwha S'Klallam Tribe

FR: Jim Baker
Northwest Salmon Campaign Coordinator
Sierra Club

RE: Impacts on Regional Power Supply

The discussion in VI-H, "Impacts on Regional Power Supply" on pages 120-123 of *The Elwha Report* contains several inaccurate or misleading statements which cry out for correction in the final report.

The text in the draft report reads, "The two most likely scenarios, medium-high loads and medium loads, show deficits of 2,896 aMW and 1,702 aMW, respectively" (p. 120). The Northwest Power Planning Council develops its load forecasts so that the medium load path — not the medium-high track — is the most likely scenario. Reference to the medium-high deficit is certainly unnecessary and probably misleading, and should be stricken from the final report. The text in the final report should also reflect the fact that the dams' power output represents less than 1.1 percent of this expected medium load deficit.

The treatment of replacement resources maintains an exclusively regional scope, and ignores any and all local opportunities such as conservation and/or cogeneration at the Daishowa mill and/or by electricity consumers of the City of Port Angeles utility. With the pending retirement of the Elwha River dams, BPA can and should pursue cost-effective, local replacement resources. Instead, the current text reads, "Because of the small size of these projects compared to BPA's expected generating resource acquisition needs, it is unlikely that BPA would undertake specific actions to replace the lost power" (p. 121-122). The relatively small size of the dams' power output should make local replacement all that more attractive because of its probable feasibility.

The text continues, "Rather, the ongoing acquisition of projects would be slightly advanced in time to cover the need created by the Elwha retirements" (p. 122). If BPA does not pursue specific local replacement options, this statement is true.

In which case, the methodology for calculating cost of replacement power is entirely false. The current discussion compares the present value of power over a 40-year period generated either at the dams or at replacement resources. If the dams' retirement in 1997 would advance in time the ongoing acquisition of regional

---

Sierra Club — Page 2

power resources, as asserted earlier in the text, then the appropriate and proper approach for calculating the cost of replacement power is to estimate the probable cost of 18.7 average megawatts of new power supply resource in the year 1997 — definitely not over a 40 year period.

We want to know what BPA will spend on replacement resources when the Elwha dams go off-line in 1997. Instead, the methodology in the current discussion tries to answer the question "What costs would BPA avoid if the agency didn't have to replace the Elwha dams?" If we are going to pursue this latter, irrelevant question, then the calculation must include the costs of operating the two dams beyond the year 1997. Instead, the text states, "No mitigation costs for licensing Elwha or Glines Canyon were included in the base case and no decommissioning costs or foregone operation and maintenance costs were included in the alternative case" (p. 122).

The Northwest Power Planning Act directs the BPA to acquire cost-effective conservation, renewable, and cogeneration resources before relatively expensive thermal power plants fired by fossil fuels. If BPA is following the law, the agency in 1997 would have far more conservation (and other highly cost-effective resources) available for acquisition than it would over the following 40 years. Indeed the text states, "Replacement resources were drawn from the stack of resources. . .(Table 11) in order of cost-effectiveness" (p. 122). But under the current methodology, the replacement resources were drawn from the stack over a 40 year period rather than just in 1997 when the dams go into retirement.

This error has two unacceptable consequences in the draft report. First, the estimated cost of replacement power runs much higher than what BPA will actually experience. In 1997, the stack of available resource options will still contain such large amounts of relatively inexpensive conservation that BPA's actual costs to replace the Elwha dams at that time will fall at or near the lower end ($20 million) of the range offered in the draft report. In the Elwha legislation (P.L. 102-495), the dams' owners receive $29 million for replacement power. I see no compelling reason whatsoever to believe that this "marketplace assessment" of replacement power costs is inaccurate.

Second, because conservation will be the replacement resource of choice, the environmental impacts, particularly on air quality, will be considerably smaller than the estimates which appear in the draft report.

For the final report, I would respectfully suggest the following changes in the text:

Sierra Club - Page 3

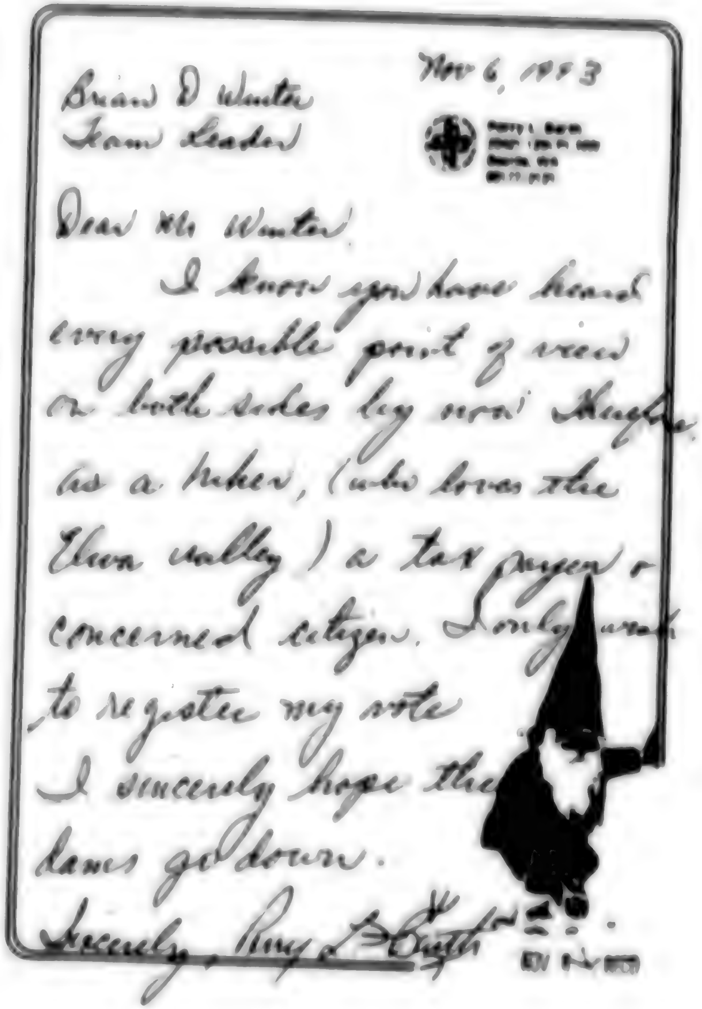
1) Strike all reference to medium-high load forecasts

2) Note that options are available in the Port Angeles vicinity to capture conservation and cogeneration as replacement resources.

3) Strike the entire discussion under "2. Cost of Replacement Power." In its place, note that P.L. 102-495 would provide $29 million to the dams' owners in replacement for the projects' power supply. Sauce for the goose is still sauce for the gander, and BPA will probably incur similar costs to replace the dams' output upon their retirement in 1997.

4) Strike the entire discussion under "3. Environmental Consequences" with the exception of the first paragraph. In the first paragraph, strike the sentence: "The resulting releases of key air pollutants and carbon dioxide can be estimated" (p. 122).

Alternatively the preparer(s) of the analyses provided in this section of The Elwha Report (presumably the Northwest Power Planning Council and/or the Bonneville Power Administration) should recalculate costs and consequences of replacement power incorporating the assumptions recommended in this memorandum.



Nov 6, 1993

Brian D Winter
Team Leader

Dear Mr Winter,

I know you have heard every possible point of view on both sides by now. Though, as a hiker, (who loves the Elwa valley) a tax payer or concerned citizen. I only wish to register my vote

I sincerely hope the dams go down.

Sincerely, Roy L [illegible]

GOOD MORNING, 5 NOV 1993

- I WOULD LOVE TO SEE THE ELWHA DAMS REMOVED.
- I WOULDN'T MIND MY TAX DOLLARS BEING USED FOR THIS
- THERE ARE HIGH COSTS FOR REMOVAL, BUT AREN'T THERE ALSO COSTS FOR KEEPING THE DAMS?

BOTH ECONOMIC: DAM UPKEEP, HATCHERIES, LESS COMMERCIAL FISHING, SPIT EROSION.

AND BIOLOGICAL FEWER FISH, FEWER ANIMALS IN AREA THAT FEED ON FISH.

☆ A FREE RUNNING RIVER IS PRICELESS, AND FEEDS THE HUMAN SPIRIT.

THANKS

NOV 8 - REC'D

JEFF BROWN 18 HAMILTON ST NE POULSBO, WA 98370

Marilyn Cunningham
8411 Sunset Lane N.W.
Seabeck, WA 98380
November 5, 1993

Dear Mr. Winter,

My husband and I are most supportive of the project to remove the Elwha and Glines Canyon Dams. Living on the shores of Hood Canal, we have seen first hand the results of totally inappropriate decisions relating to the survival of salmon runs in this state. The resource is in a shambles. Let's do what must be done to save it!

Sincerely, NOV 8 - REC'D
Marilyn Cunningham

E 11/8

415

KEN SLEIGHT
Park Creek Ranch
P.O. Box 1270
Moab, Utah 84532

November 3, 1993

Brian Winter
Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Mr. Winter:

Please send me a copy of The Elwha Study.

I feel it is time for the federal government purchase of the two hydroelectric dams on the Elwha River and then to remove them. I certainly give my support to their removal.

Thank you.

Sincerely,

Ken Sleight

NOV 8 - RECD

Nov. 6, 93

NOV 8 - RECD

Mr. Winter,

I am for the dams being removed from the Elwha River.

First of all, they are very old, & I perceive, dangerous. If we do get the 7 or 8 point earthquake in our area which is being forcast, will they stand? Will they hold up to very heavy rains, which have been effecting other parts of the world over the past few years? This area's turn could come up any time. Also, the silt buildup behind these dams ~~have~~ has limited their capacity to such a degree that their efficiency is questionable.

Lastly, it would be good to restore the Elwha system to its primative state, if possible, which would restore the natural integrity of the National Park & if the fish runs were restored the sport fishing industry in the area would greatly benefit. Sincerely, D. Humfleet

Dennis Humfleet
101 [illegible]
Port Ang
98362

415

Nov 4, 1993

19802 65th Ave NE
Seattle, WA 98155

Dear The Honorable Bruce Babbitt,

I totally support your report regarding the removal of both dams from the Elwha river. I am currently a Botany student at the UW, and I have had the opportunity to work on the Olympic Peninsula this summer -- so I realize that the removal of both dams is necessary to preserve both the fish runs, and the ecological diversity of the fauna and the flora of the Peninsula. Go Bruce Go!!! Save the Pacific NW from human destruction!

Sincerely,

Mandy Tu

416

6752 View Dr. S.E.
Port Orchard, WA 98366

October 21, 1993

The Honorable Bruce Babbitt
c/o Olympic National Parks
600 E. Park Avenue
Port Angeles, WA 98362

Dear Mr. Babbitt:

I am just delighted to see that you have taken a strong stand in support of the Elwha River Restoration Plan. I am a great lover of the outdoors and I especially love the Olympic Mountains here in Washington State. To me, the Elwha River is an extremely important part of the Olympics.

Removal of the two dams will hopefully restore the wild salmon run that used to provide an abundant fishery. The removal of the dams will also remove a blight from the river and provide restoration of scenic and recreational values to the area.

Please see what you can do to obtain adequate funding for this project and to expedite the program. I am sure that the vast majority of the citizens in the State of Washington will support you in your efforts.

Yours truly,

Brigitte Elwell

Brigitte Elwell

NOV 8 - [illegible]

416

Dear Mr Babbitt,

Thanks for your strong support on the Restoration of the Elwha River Ecosystem. We strongly agree that these dams must be removed to restore the Elwha River and help the salmon! Thanks again

Liz + Jim DeNiro

James & Elizabeth De Niro
N [illegible] Rd
Mead, WA 99021

NOV 4 - RECD

WOLFGANG RAIN
7029 21ST AVE NE
SEATTLE, WA 98115-5713
(206) 524-0528

NOV 4 - RECD

1 November 93

Dear Mr. Winter:

It is my belief that the long-term benefits of removing human-made obstructions in the Elwha River will ultimately exceed the expense of such a project.

As a fisheries biologist and naturalist (the latter by default) as well as a lifelong resident of Western Washington State, I have witnessed first-hand what habitat degradation and removal have done to the endemic species of plants and animals in my own home. The Elwha drainage has a unique genetic resource in its native salmon. The damming of the Elwha is a primary reason that we are close to losing these native fish. It was a dirty trick that allowed the building of the dam without provision for fish passage.

My hope is that the dam be removed from the Elwha, and a careful study made of resulting changes in the wild populations of salmonids. Perhaps in the years to come, when the inability of artificial populations to sustain themselves really comes to bear in other dammed river systems, the Elwha will exist as a model for restoration of naturally-selected populations.

It will be a very good day, I suspect, when the Elwha salmon have a place to return home to. Restoration of habitat cannot take place overnight, but we can sure as hell start by mending the wrongs we have imposed, such as the Elwha dam.

Take the (dam) thing down! Sincerely, Wolfgang Rain

Cindy S. Barger
3801 Brooklyn Ave., N.E. #D137-3
Seattle, WA 98105

October 23, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Re: *The Elwha Report*

Dear Secretary Babbitt

I am writing to comment on the Department of Interior's report on the Restoration of the Elwha River Ecosystem and Native Anadromous Fisheries. I would like to congratulate you on your decision to remove the dams and recover the salmon to the Elwha River. I also encourage you to move swiftly with this report and appropriate funds now to begin the removal, before its too late.

The decision to remove the dams is the first step on a long trek to help restore the anadromous fish to the Elwha. If we continue to move at the pace typical for government action, we will loose the wonderful opportunity of returning an altered habitat to its natural state. This summer, local outdoorsmen and members of the Elwha tribe saw a minimal return of the spring chinook and no sitings of pink salmon. The numbers are declining faster than expected -- for the pink it may already be too late. The Elwha *must* be a top priority in the Department of Interior's budget, for the sake of our salmon and our rivers.

The need for a definite plan of action for restoration is necessary to ensure a strict timeline and expedient removal of the dams. In considering the safety of the fish habitats and limited disturbance to the ecosystem, Plan 1 - Surface Diversion Channel for the Elwha Dam and Plan 1 - Low Level Diversion for the Glines Canyon Dam should have a strong focus. The Combination of Removal and Washout (Scenario 9) for sediment management plans is appears to be the safest alternative for retaining the fish habitat during sediment reorientation and restoring the river to pre-dam conditions as close as possible. Other scenarios either endanger the species greatly in the process and/or do not make a strong enough effort to return the river to its natural state (which would go against the entire objective of the dam removal).

Thank you for your time and efforts in regards to the Elwha River Restoration. Time is of the essence, please, for the sake of the Elwha, move quickly.

Sincerely,

Cindy S. Barger
3801 Brooklyn Ave., N.E. #D137-3
Seattle, WA 98105

ENV 4 - REST

R 11/8

Erik Schmidt
Center for Public Policy Research
Campus Box 330
University of Colorado
Boulder CO 80309

November 2, 1993

Brian Winter
Olympic National Park
600 E. Park Ave
Port Angeles WA 98362

Dear Mr. Winter

Permit me to do two things at once in this letter -- request a copy of the Elwha Study released September 30, and comment on the proposed removal of the Glines Canyon and Elwha dams. The former I assume should be routine. Now for the second part. I am a graduate student at the University of Colorado studying the integration of wildlife and habitat conservation with sustainable community development. Last May, I visited the Elwha River, the two dams in question, the salmon hatchery on the Lower Elwha Indian Reservation, and the Daishowa pulp plant in Port Angeles. So I feel a special interest in how this issue is resolved.

After seeing this beautiful river canyon for myself, I can clearly envision the wonderful effects removing the dams would have. It would be a tragedy if the opportunity to restore the salmon runs and other natural features of the Elwha is lost at this point. With shifting political winds, who knows when the momentum to accomplish such a brave objective could be gathered again. In addition, I believe that removal of the dams, contrary to what some detractors claim, will turn out to be an economic boost to the Port Angeles area, and in the long run will become a milestone in the region's economic development.

Please pass on my hope to Secretary Babbitt that he include funding for the Elwha River restoration in his FY 1995 Interior Department budget. Thank you very much.

Sincerely,

Erik Schmidt

Erik Schmidt

ENV 8 - REST

419

11-8-93

Dear Mr. Babbitt,

Thank you for your past support for restoration of the Elwha River Ecosystem. I agree with you that the dams blocking the river must be removed to help restore the salmon runs and the natural river ecosystem. Please make this project a high priority for funding in future appropriation requests.

Sincerely,
Stephen J.
Steilacoom WA

NOV 10 RECD

Olympic Park Associates
13245 - 40th Avenue N.E.
Seattle, Washington 98125

November 8, 199

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362-6757

Dear Dr. Winter:

Olympic Park Associates commends the Elwha Resoration Interagency Team for its comprehensive overview in the September 1993 Public Review Draft of ***The Elwha Report***. Founded in 1948, Olympic Park Associates, a citizen organization, has a 45-year history in its interests and efforts on behalf of assuring protection and restoration, where needed, of the naturally evolving ecosystem of Olympic National Park.

As is noted in the report, Olympic Park Associates was one of the initial four intervenors before the Federal Energy Regulatory Commission seeking to have licenses for the Glines Canyon and Elwha Dams denied. We testified before Congress on behalf of what became Public Law 102-495, the "Elwha River Ecosystem and Fisheries Restoration Act." We are pleased that the Interagency Team finds removal of the two dams from the Elwha River and restoration of the ecosystem and fisheries to be feasible. Accordingly, Olympic Park Associates urges that the Environmental Impact Statement process be started as soon as possible, but no later than the beginning of Fiscal Year 1995.

We look forward to the replication as nearly as possible of the historically fabulous fish runs once in the Elwha River and the natural evolution of the indigenous wildlife to populations that would have developed had their fishery food source not been blocked by the Elwha dams.

We note that when Olympic National Park was designated a Biosphere Reserve and a World Heritage Site, it was considered to be one of the more natural areas remaining in spite of past damage to its ecosystems. Removing the Elwha River dams will help bring back its once famed fisheries and its watershed's ecosystem resulting in Olympic National Park being an ever more valuable Biosphere Reserve.

Sincerely,
Polly Dyer
Polly Dyer, President

Founded 1948 "To preserve the integrity and wilderness of Olympic National Park"

NOV 10

419

Seattle
Audubon
Society

Washington Nonprofit Corporation

November 9, 1993

Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Re: Elwha River Restoration Report Pursuant to Public Law 102-495

Dear Secretary Babbitt:

420

The Seattle Audubon Society is an organization of over 5,000 members which is dedicated to the conservation of wildlife and their habitats, environmental education, and recreation. The Society has long been interested in the protection of the ecosystem of the Olympic Peninsula, of the globally recognized (through World Heritage Site status) Olympic National Park, and in the restoration of native fisheries stocks. Seattle Audubon and its fellow intervenors brought expertise and knowledge in the environmental, energy, and political areas to the hydropower licensing process, and played an important role in the development of the negotiated settlement that led to the enactment of PL 102-495.

Seattle Audubon has reviewed the Public Draft of The Elwha Report, and concurs with the determination that removal of both the Glines Canyon and Elwha dams is the only alternative that meets the goal of The Elwha River Ecosystem and Fisheries Restoration Act (PL 102-495), the "full restoration of the Elwha River ecosystem and native anadromous fisheries". We also concur with the determination that removal of the two dams is feasible.

We furthermore agree that a tremendous opportunity is presented in the Elwha River for ecosystem and fisheries restoration. The removal and rehabilitation work, the restored fisheries, and the rehabilitated ecosystem will also help meet treaty fish responsibilities, and will provide substantial near- and long-term environmental and economic benefits to the people of the Peninsula.

The Seattle Audubon Society urges you to submit the final report to Congress as provided in PL 102-495. We consider it imperative for the health of the anadromous fish stocks that work begin on the environmental impact statement immediately after submittal of the report, and we urge you and the Administration to expedite this and

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to seek full funding for the review and restoration process in the upcoming budget. Thank you.

Sincerely,

Robert G. Sieh
President

cc: Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team

LOWER ELWHA TRIBAL COUNCIL

[illegible]

November 3, 1993

Dr. Brian Winter, Report Coordinator
C/O Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

Dear Dr. Winter

We are writing this letter in support of Elwha River Restoration. As individual tribal members who have spent many years living along the Elwha River, we have seen the damage caused by the dams. We have seen the river system and the fish runs die away as a result of the dams and their reservoirs. The salmon were our most precious resource, because they gave us food and they were a symbol of our Creator's goodness and protection.

Damming the river and destroying the fish runs was a terrible blow to our subsistence economy, and an insult to our culture and our spiritual beliefs. The dams caused flooding of our most important spiritual sites and cut us off from our heritage. Dam safety has caused us to live in fear for our lives and to risk losing our homes and fishing equipment. We have subsidized the cheap power with our lives, our jobs and our way of life.

The Elwha River Ecosystem and Fisheries Restoration Act represents a real solution to the problem of the dams on the river. We want to see the dams removed and the river restored. We are very proud of the important role the Tribe has played in developing both the legislation and the report you have recently sent out for public review. We want you, the Secretary, and all of Congress to know how important this issue is.

Too much of the public and media focus has been on the cost of removing the dams. There needs to be more education to people about the high cost of keeping the dams-in terms of court battles continuing damage to the river system, extinction of native fish runs, oppression of the Elwha Klallam people-and the huge opportunities-employment, tourism, fishing, cultural programs-presented by River Restoration. The opportunity presented by the legislation is truly remarkable, and is one that must not be missed. The cost of leaving the dams in is far to high.

Congratulations on a well done report. We wish you every success.

Sincerely,

Jamie R Valadez, other signatures on next page.

NOV 10 REC'D

Beatrice E. Charles
Adeline Smith
[illegible]
Charles M. Sampson Sr.
Floyd E. Charles, Sr.
Lloyd F. Cooke
James E. Charles
Ellen C Charles
[illegible] A Rhodes
[illegible]
Jamie R. Valadez
Jackie Johnson
Edward Charles
William C. [illegible]

11/9/93

Dear Secretary Babbitt,

I support the conclusions of the report advocating removal of dams on the Elwha River

Respectfully yours

V S Parmer

NOV 9 - 1993

422

10674 Falk Road NE
Bainbridge Island
WA 98110 Nov 9, 1993

Bruce Babbitt, Secretary of the Interior

Dear Friend,

I was travelling when your Draft Report on the Restoration of the Elwha was released otherwise I would have written you at once.

The Elwha has been dear to me for many years. I appreciate your strong report in favor of its restoration. It is not often that we have such a good chance to reverse past mistakes.

I urge you to push hard for immediate action. The salmon runs there are at a critical state and cannot survive further delays.

Thank you for your consideration.

Sincerely yours

Donald N Witheler

NOV 10 RECD

422

Wayne E. Mayer
3936 Woodland Park Ave. N
Seattle, WA 98103

November 6, 1993

The Honorable Bruce Babbitt
Secretary of the Interior
in care of Olympic National Park
600 E. Park Ave
Port Angeles, WA 98362

Dear Honorable Bruce Babbitt:

In quantum mechanics it is understood that "you cannot observe an entity without in some sense touching it, and you cannot touch it without having an effect on it" (Heisenberg in Quammen 1992). One cannot construct hydroelectric dams in the fourth largest river on the Olympic Peninsula without effecting the ecosystem of the river. The Elwha's sockeye salmon are extinct and the spring chinook, pink and chum salmon are threatened with extinction. The restoration of the pre dam biological, hydrological, and physical processes composing the free-flowing Elwha river is essential for the survival of salmon.

Retreating glaciers carved the Elwha River system during the Pleistocene period more than 10,00 years ago. The relatively recent construction of the dams (1913 & 1927) have flooded "5.3 miles of river and 684 acres of lowland habitat" (The Elwha Report). Without the continual flow of water, "about 11.3 cubic yards of sediment are trapped in Lake Mills and 2.6 to 4 million cubic yards of sediment are trapped in Lake Aldwell" (The Elwha Report). Since bedload sediments do not travel beyond the dams, former spawning ground erodes. The former spawning ground contains substrate too large to be used by spawning fish. Until the dams collapse the natural movement of sediments remains blocked and will result in further degradation of the river and associated biological communities. Only removal of the dams coupled with planting native vegetation can restore suitable spawning habitat for the endangered salmon. The areas effected by the drained reservoir would, over time, develop into the ecosystem of surrounding lands and waters.

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The Elwha Restoration Report explains the feasibility of "removing the dams, protecting existing water users, and fully restoring the ecosystem and native anadromous fisheries." The implementation of the Elwha River restoration plan would not "drain" the Port Angeles community of electrical power because the town's electrical energy needs would be provided for by the Bonneville Power Administration. I believe that removal of the Elwha and Glines Canyon dams opens the only path toward "full restoration of the Elwha River ecosystem and native anadromous fisheries." I urge the Department of the Interior to take necessary action: remove the dams and allow the Elwha River to flow freely.

Sincerely,

Wayne E. Mayer

Wayne E. Mayer
University of Washington, College of Forest Resources

NOV 10 RECD

ANN AMBERG

11 4 93
The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Ave
Port Angeles, Wa 98362

Dear Secretary Babbitt,

I am writing in strong support of the Elwha River Restoration plan. Here is an opportunity to again allow a vital and life sustaining ecosystem to exist! The salmon and steelhead runs on this river are the bloodline that ties together this region and its people. The Indians in this area have always known that without the salmon, all life that is interdependent would collapse.

The Elwha and Glines Canyon dams were built with gross disrespect for both this powerful river and Oympic National Park from which it flows. It is crucial that funds for the removal of the dams and the resoration of the river will be included in the Interior Dept. budget for the 1995 fiscal year.

Sincerely,

ANN AMBERG
127 5th Ave. West #3
Kirkland, Wa 98033

NOV 9 - RR

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Club
Cascade Chapter

1516 Melrose Avenue
Seattle, Washington 98122
206 62[illegible] 1481
Fax 206 621 9110
Hotline 206 62[illegible]

November 8, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E. Park Avenue
Port Angeles, WA 98362

re: The Elwha Report, Public Review Draft, September 1993

Dear Secretary Babbitt:

I write on behalf of the Sierra Club Cascade Chapter to comment on the Public Review Draft of the Elwha Report.

The Chapter praises the report for its conclusion that "[t]he removal of the Elwha and Glines Canyon dams is the only alternative that would result in the 'full restoration of the Elwha River ecosystem and native anadromous fisheries.'" Report, at 129. We also fully agree with the report's conclusion that dam removal is feasible. The Cascade Chapter has long argued that the facts supported both of these conclusions, and we are pleased that the report provides further scientific support for our position.

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The report's authors -- Dr. Brian Winter and the staff he oversees -- deserve a great deal of credit for their hard work in drafting the report and ensuring that it was completed on schedule. The schedule is extremely important because time is critical in the drive to restore the Elwha River ecosystem. As every day passes, we run greater and greater risks of depleting the gene pool which still survives in the remnant anadromous fish runs in the lower Elwha. For this reason, while the Cascade Chapter supports the general conclusions in the report, we are concerned about the report's timetable for dam removal.

We ask that the restoration schedule include less time for data collection and EIS preparation. The issues of ecosystem restoration and sediment management have been intensively studied during the FERC licensing proceedings and during the preparation of this report. We also request the acquisition of the Elwha and Glines Canyon projects be moved forward, because restoration efforts can ill afford to lose momentum or the support of the current project owners. If these key steps are taken more quickly, then dam removal and sediment management activities need not be delayed until 1998.

to explore, enjoy
and preserve the
nation's forests,
waters, wildlife
and wilderness

NOV 9 - RECD

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To further ensure that dam removal and ecosystem restoration efforts do not stall or stagnate, we ask that you make funds for the Elwha Restoration Project a priority in the Interior Department budget. We ask the Department not to saddle the Park Service with all of the costs of planning and implementing dam removal, but to instead pursue means to share the costs of this proposal among the several interested intra-Department agencies. We also ask you to further investigate methods to share costs with agencies outside the Department, such as the Army Corps of Engineers. This Project presents an extraordinary opportunity for any agency to gain valuable expertise in ecosystem restoration.

While we have offered these few suggestions to improve the final report, it is clear that the draft report has added excitement to an already exciting time. When the final report is issued we will have taken a vital step toward the goal which we all seek: restoration of the Elwha ecosystem and its anadromous fisheries. With the timely dedication of necessary resources, we can continue working together to reach this goal.

Thank you for the opportunity to comment on the draft report. We look forward to continuing to support you in your pursuit of dam removal and the full restoration of the Elwha ecosystem.

Sincerely,

Eric Broman

Eric Broman
Cascade Chapter Elwha Coordinator

Bill Robinson
4600 S.W. Graham
Seattle, Washington 98136-1455

November 8, 1993

Dr. Brian Winter
Elwha Restoration Interagency Team Leader
Olympia National Park
600 E. Park Avenue
Port Angeles, Washington 98362-6757

Dear Dr. ~~Winter~~ Brian

I would like to thank you for coordinating all of the cooperating agencies in the development of this thorough analysis of the restoration prospects of the Elwha River. We in Trout Unlimited are proud to have been able to participate in the development of this historic win-win legislative settlement. Trout Unlimited, as a national conservation organization (and Elwha intervenor) with over 70,000 members, is fully supportive of the goal of the Elwha River Ecosystem and Fisheries Restoration Act (Public Law 102-495) which is the full restoration of the Elwha River ecosystem and native anadromous fisheries.

Trout Unlimited is fully supportive of Alternative "A", removal of both Glines Canyon and Elwha Dam's which has been determined by the Secretary of the Interior as being feasible. The need for these actions to occur is abundantly clear. Dam removal will allow for the restoration of the fish and wildlife resources of the Elwha ecosystem. Dam retention will dim any restoration prospects for restoration of native anadromous fisheries in the Elwha River ecosystem in the future. Alternative "A" will ultimately lead to a restored Elwha River ecosystem with a return of the natural "run of the river."

Native anadromous fish stocks throughout the West Coast of the United States are to an alarming degree in serious decline. The concepts of ecosystem management or ecosystem restoration are being given the utmost attention as ways to address these serious declines and to begin coast-wide restoration efforts. The Elwha River Restoration Act provides a very high profile opportunity to demonstrate that ecosystem restoration is indeed plausible. The Elwha River ecosystem drains 321 square miles of which 287 square miles of pristine habitat are located within the Olympic National Park. This habitat is of immense importance to the concept of ecosystem restoration. The decommissioning and removal of both Glines Canyon and Elwha Dam (Alternative "A") will allow unimpeded access by the native anadromous salmonids into this healthy environment. This in turn will be of tremendous benefit to the fish and wildlife resources of the Elwha ecosystem. The decommissioning and removal of the Elwha Dams as outlined in Alternative "A" will be of great benefit to the water quality and quantity needs of returning salmonids. Historically, elevated water temperatures as the results of impoundments by the "dams" have caused high moralities of returning salmonids as a result of stress and parasites brought on by these high temperatures during periods of low flows. This will be alleviated by Alternative "A".

America's Leading Coldwater Fisheries Conservation Organization
Washington, D.C. Headquarters 501 Church Street, Northeast • Vienna, Virginia 22180 • 703-281-1100

The "full restoration of the Elwha River ecosystem and the native anadromous fisheries" plan, which must be developed for Congress, by January 31, 1994 by the Secretary of the Interior has many far reaching benefits besides the obvious to the fish and wildlife resources of the Elwha River ecosystem. This plan will serve as a "demonstration project" as to how to deal with dam removal and all of the technical details such as sediment removal, turbidity and stabilization. The development of a database on dam removal will be invaluable in the future as numerous exercises of this nature will need to be done. The price estimates of this project are well worth the benefits which will accrue.

The Elwha River Restoration Report is clear: "The ecosystem cannot be restored with the retention of either or both dams." As a Trout Unlimited representative testified before Congress on this issue -- "Torpedo the dams, full speed ahead."

Again, on behalf of all of the members of Trout Unlimited, I appreciate the opportunity to comment on the draft and look forward to future involvement.

Yours in conservation,

Bill Robinson

Bill Robinson
Region IX Vice President
Trout Unlimited

BR:mek

cc:

The Honorable Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
Port Angeles, WA 98362

Nov. 6, 1993

Dear Secretary Babbitt,

Bravo for the Interior Department report on restoring the Elwha River ecosystem! After suffering through so much depressing news about humanity's depredations on our natural resources, it was a joyful day to read an official recommendation favoring restoration of an ecosystem and righting an old wrong done to this poor old Earth.

Surely, the day that you or a successor (let us hope it is you) gets to press that plunger that will begin the removal of those Elwha River dams is one to look forward to. But we can't unless Congress appropriates the funds necessary for dam removal, cleanup and ecosystem restoration. Please do all you can to persuade Congress of the long-term value the restoration project will have for the nation. In addition to the economic value of a restored world-class fishery (think of the anglers who will spend money on the Olympic Peninsula to hook a 100-pound chinook salmon), we must think of the long-term value of an intact national park as a repository of natural capital and of the nation's natural heritage. May I quote from the book "This Land is Your Land."

"Park lands and open wild lands are the premier class of public lands, a nation's most tangible expression of freedom. Protecting and enjoying them is a high purpose. Their wealth is an example to all people of resources shared, of a sacred trust in land and the future. National park lands are more than wild laboratories or priceless historic and cultural sites; they are part of the power of our nation, as great a contributor to national strength as steel mills and armies. Park lands are the best of our nation. We as a people and as a country are enlarged by their protection."

Let's do it. And then on to hetch hetchy!

Jim DiPeso

23240 88th Ave S #RR101
Kent WA 98031

NOV 9 - RECD

Gordon D. Kinder III
2100 3rd Avenue, #1604
Seattle, WA 98121-2303
November 7, 1993

Dr. Brian Winter
Team Leader
Elwha Restoration InterAgency Team
Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362-6757

Dear Dr. Winter:

I am writing in my capacity as Board member of Olympic Park Associates to urge you to move forward with the preparation of the Environmental Impact Statement (EIS) for removal of the Elwha River dams with all due haste.

Yours truly,

Gordon D. Kinder III

Gordon D. Kinder, III

NOV 9 - R

Instead of knocking the whole dam down, make a hole in the base for fish and water.

Idea from Realitor in Port Angeles.

OCT 22 REC'D

4253 Whitman Avenue North, Seattle, Washington 98103

5 November 1993

Dr. Brian Winter
Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362-6757

Dear Brian,

It is a pleasure to be able to contribute ideas towards the best ways of restoring the Elwha River to its original free flowing state, rather than providing endless reasons why it is desirable to do so. At the turn of the century, the newspapers trumpeted man's conquest over nature and today on the Elwha, virtually everyone is discussing the return to nature for the benefit of man. Maybe it is possible to leave a monument to our predecessors while at the same time, minimize the cost of restoring the lower canyons on the Elwha to their original state.

Please consider only removing perhaps a thirty foot high section at the bottom of the Mills Dam and leaving the great bulk of the concrete in place as a reminder of our past. "Tunneling" the dam will save millions of dollars over complete removal without effecting the salmon or recreational aspects of the newly free flowing river. The lower dam should be removed completely.

There is some discussion over how quickly the lake should be lowered. Some feel that silt and other lake debris should be prevented from rapidly spilling out to the sea. No matter how slowly (and expensively) the water is lowered, some day the rains will come with enough vengeance to wash the silt away. The canyon below Mills Lake, according to Press Expedition reports, is more grand than the Grand Canyon, and when the water rises, the hydraulic power will be immense. Please consider a more natural, rapid, water level reduction, to expedite the beginning of true recovery. After all, many natural dams form from land slides, and when they go, they go quickly. If any extra expense is warranted, it should be to ensure that the natural canyon walls (which are black) be restored from the concrete (which is light gray) as closely as possible to their original sculpted shape, rather than a angular man-made gutter. It is critical to recreational use of the canyon, and helpful to the salmon, that pools and eddies are returned and any steel be completely removed.

Thank you for the opportunity to contribute and thank you for your efforts to arrive at a sensible means to free the Elwha.

Sincerely,

H. Sprague Ackley

NOV 9 - REC'D

4 Nov. 1993
Port Angeles

Mr. Brian Winter
Interagency Teamleader

I have reviewed your Elwha Study Report in detail. Rather than comment on the entire content and thus waste my time, will say until such time as a real study is compiled by an unbiased group your study is an example of extreme slanted views.

The american taxpayer isn't willing to permit such an expensive proposal as dam removal to satisfy the enviros and the dam park.

Not only do I find a lack of imagination dealing with fish passage, but you yourself admitted to me at the public workshop that you don't consider yourself a fish passage expert. If so, why must such representatives of federal agencies advise we must remove the dams?

A brief phamplet distributed at the workshop stated 14-19% of fish would be killed while using a fishway or transported by truck. Except for spring Chinook (which should be restored in Elwha) there would be no problem.

No pink salmon were observed in the Elwha this season and thanks to all you professionals? they likely are extinct.

No one cares about the Chum salmon, so why not retain the dams, save money and compromise the situation and work with chinook, cohos, steelhead and sockeye?

With or without the dams there could never be full fish restoration and in fact dam removal will likely destroy remaining natural spawning below lower dam.

The various agencies have caused James River Corp. to spend 15 million to date and no new hydro license issued or any salmon going upstream? Talk about incompetence!

The park even wanted $50,000 from James River to study elk, what the hell does elk have to do with fish restoration or hydro power production?

There must be a fish ladder at upper dam if dam remains (pool & weir type only) to permit downstream out-migration of adult steelhead and juvenile fish during no spill periods. There must also be a surface penstock pipe joining existing penstock pipe during outmigration with the present deep penstock closed during out migration periods.

Park visitors delight in using Lake Mills and viewing the water spills at Glines dam.

Dam removal advocates are a definite minority, so why not give up and quit wasting our money and time.

B. L. Adamire
Advisory Member

3141 East Greentree Lane
Port Angeles, WA 98362
7 November 199[illegible]

Dr. Brian Winter
c/o Olympic National Park
600 East Park Ave.
Port Angeles, WA 98362

Dear Dr. Winter:

I am delighted that Secretary of the Interior Bruce Babbitt has determined that removal of the Glines Canyon and Elwha dams is both feasible and the only way to achieve full restoration of the Elwha River ecosystem and anadromous fisheries, based on studies and reports by National Marine Fisheries, local tribes, the National Park Service, U.S. Fish and Wildlife Service, the Bureau of Reclamation, and others. After attending the public information workshop on October 18, I have been wanting to add my voice to those who think removal of the dams is a good idea, and as a biologist, I am eager for the process to begin. I am excited that I will have the opportunity to observe the comeback process. I began my years as a taxpayer during the Vietnam War; starting then, I have had many opportunities to regret how my taxes have been spent. It will be an actual pleasure to have them spent in this way!

Some brief thoughts:

I do wholeheartedly support the idea of restoring all native species of Pacific salmon to all portions of the Elwha watershed.

I think that there are no adequate ways to accomplish this (fish ladders, hatcheries, physical transport are all inadequate). Only dam removal can undo the habitat loss and degradation and allow the conditions necessary for fish run restoration.

I have long been concerned about the concomitant effects on other wildlife that happened when salmon runs up the Elwha were shut off by the dams. These other species -- bald eagles, osprey, black bears, and many others -- have been deprived of significant food sources. Since the entire Elwha drainage above the dams is included in Olympic National Park, restoration of these other wildlife populations is further supported, as their habitat is otherwise almost pristine.

I do not doubt our technical ability to remove the dams safely and effectively.

Given the seed source that surrounds the area now flooded by the dams and the optimum lowland forest site that will be exposed again, I think it is completely reasonable to expect full riparian habitat restoration over time.

So, this taxpayer says YES, let's do it! Let's get started as soon as possible, let's make sure the needed funds are appropriated quickly, and let's get specific about a timeline for accomplishing this project.

I appreciate being able to add my comments to the record.

Sincerely,

Pat Willits

Pat Willits

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Street
Port Angeles, WA 98362-6757

October 25,1993

Dear Dr. Winter:

This letter is in reponse to the issuance of the Elwha Report, dated September, 1993 (pursuant to Public Law 102-495). On behalf of the local Trout Unlimited (TU) chapter, we would like to submit the following comments on your report. The Blue Mountain Chapter consists of both Washington and Oregon residents from the Walla Walla, Pendleton, and surrounding areas respectively.

First, let me state the Blue Mountain Chapter of TU heartily supports your recommendation to remove the two dams that are in the Elwha River. Only through removal of these dams can there be ecosystem restoration for the watershed. It is an excellent project and deserves the full support of National Marine Fisheries Service and the Department of Interior.

To reinforce your decision to remove Glines Canyon and Elwha Dams, We would like to take this opportunity to point out a number of reasons to do so. These dams were built in direct violation of state laws because no ladders were built to provide for passage of "food fish". The dams impact wild salmonids that once inhabited Olympic National Park (ONP). Only by removing these dams can the Park Service fulfill its role to protect wilderness in perpetuity.

Bruce Brown's Mountain in the Clouds states that the runs of chinook salmon in the Elwha River contained the largest salmon south of the Kenai River. You have an opportunity to restore biodiversity by returning these large fish to the park. Granted, you may not have fish return to the size of the historical records, but an attempt should be made to do so.

On page 114 of the report, you refer to disposition of the lands once the projects are removed. Any lands that are converted into ONP ownership should be maintained in their primitive state so they can be converted into wilderness designation.

What is the long-term plan for the two hatcheries? Nothing is stated beyond a certain time frame. There should be definite plans for removal of the hatcheries once the runs have established themselves. This would allow for only wild propagation of the species, thereby avoiding all of the problems inherent with hatcheries, one of the minor ones being financial support.

Page 121 speaks to the issue of the replacement cost for electricity. Wind power has had significant advances, such that the price of it has dropped considerably in the past few years, down to approximately 5-8 cents per kwh. This figure will only continue to drop through new advances in technology. As a starting point, We suggest you read an article from Atlantic magazine outlining these advances.[1] Perhaps you are too quickly disregarding the use of this form of renewable energy. Wind has little externalized costs compared to other forms of electricity generation, such as pollution (fossil fuels), destruction of fisheries (hydropower), and culture,(again, hydropower in regards to Native Americans).

An additional bonus of dam removal will be a substantial economic benefit to the state and the locality. Not only will there be the short term impacts of increased tourism as people will come from everywhere to watch a dam removed, but this type of work will allow for scientific studies to be done, thereby increasing the amount of money spent in the area. And there will be numerous long-term benefits. Once the river is restored, the value of the fisheries will increase, both for commercial and sport fishing. Tourism will be at a higher level as people will travel to the site just to see where the dams once were in place.

Returning the salmon will also provide significant benefits to the local Native American tribe as outlined in your report. There are numerous positive aspects to the tribe, all of which are laudable goals.

Finally there is a great amount of scientific knowledge to be gained from removal of these dams (the living laboratory, as you referred to it in the reports). We need to know how to remove dams. All across North America dams have been built which are economic boondoggles and environmental disasters. Many of these will be removed in due time. Using the Elwha complex as a process will improve our knowledge of how to remove dams.

We were extremely impressed with your report. Not only is it graphically pleasing, but it contains much valuable information and is well put together. We commend you on the excellence of this document. We look forward to the day when the two "blood clots" on the Elwha River are removed. Thank you for the opportunity to comment.

Sincerely,

Jim Nuess

im Nuess,
President

cc: Secretary of the Interior Bruce Babbitt
Senator Mark Hatfield
Senator Slade Gorton
Senator Patty Murray
Congressman Norm Dicks

---

[1] Douglas Gantenbein."Something In The Wind" Atlantic October, 1993. pp 36-42.

NOV 1 2 RECD

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PAGE

Sierra Club
Columbia Basin Field Office
Route 2, Box 303-A
Pullman, WA 99163
(509) 332-5173
FAX (509) 332-5173

November 8, 1993

Hon. Bruce Babbitt
Secretary of the Interior
c/o Olympic National Park
600 East Park Ave.
Port Angeles, WA 98362

RE: The Elwha Report

Dear Mr. Secretary:

431

It is my personal pleasure to comment on the public review draft of *The Elwha Report: Restoration of the Elwha River Ecosystem and Native Anadromous Fisheries* - because, in July, 1991 while I was then a staffer for Friends of the Earth, you and I had the opportunity during the National Rivers Conference in Denver to discuss restoration of the Elwha watershed and salmon runs. Long before the Congress enacted P.L. 102-495 and before your appointment as Secretary of the Interior, you demonstrated both expertise on, and enthusiasm for, this effort to restore a premier anadromous fishery, a beautiful river, and a unique national park.

This report prepared by the Interior Department agencies, the National Marine Fisheries Service, and the Lower Elwha S'Klallam Tribe thoroughly and convincingly makes its case that the only way to restore the salmon and ocean-migrating trout runs as well as the Elwha ecosystem itself is to remove the Glines Canyon and Elwha hydroelectric dams. I would respectfully urge you to accept this general conclusion and its supporting documentation in the report.

In addition, I would respectfully urge you and the Interior Department agencies to move aggressively to develop a specific engineering plan for the dams' removal on as short a timeline as technically feasible. The pink salmon - once so numerous that they lifted canoes out of the water - have declined to the point of easily qualifying for protection under the Endangered Species Act. The other fish stocks are also precariously close to extinction. Therefore, for this restoration effort to succeed, the federal government and your department must act quickly.

Moreover, with the passage of time, the Congress can only find it more and more difficult to appropriate the funds necessary to carry out the dams' removal and the watershed restoration. I would respectfully urge you to make the Elwha restoration a top priority in budget-setting for the Interior Department, and to include Elwha funding in the administration's appropriations requests.

Attached in memorandum form please find a critique of the analysis in the report regarding impacts on regional power supply.

As you know, restoration of the Elwha watershed represents not only a once-in-a-lifetime demonstration project of wild salmon recovery, but a vivid case study of the interdependence of environmental and economic health. If we continue to move swiftly, Port Angeles can look forward to the win-win solution of both jobs in the local community and fish in the local river.

In closing, I would commend your department's agencies, the National Marine Fisheries Service, and the Lower Elwha S'Klallam Tribe for their very hard and good work in preparing *The Elwha Report*, and would urge them to keep up the good work harder and faster. Thank you very much for this opportunity to comment on the report.

Sincerely,

James M Baker

Jim Baker
Northwest Salmon Campaign Coordinator
Sierra Club

Attachment

NOV 12 [illegible]

431

TO: National Park Service (Department of the Interior)
U.S. Fish and Wildlife Service (Department of the Interior)
Bureau of Reclamation (Department of the Interior)
Bureau of Indian Affairs (Department of the Interior)
National Marine Fisheries Service (Department of Commerce)
Lower Elwha S'Klallam Tribe

FR: Jim Baker
Northwest Salmon Campaign Coordinator
Sierra Club

RE: Impacts on Regional Power Supply

The discussion in VI-M, "Impacts on Regional Power Supply" on pages 120-123 of The Elwha Report contains several inaccurate or misleading statements which cry out for correction in the final report.

The text in the draft report reads, "The two most likely scenarios, medium-high loads and medium loads, show deficits of 2,898 aMW and 1,702 aMW, respectively" (p. 120). The Northwest Power Planning Council develops its load forecasts so that the medium load path - not the medium high track - is the most likely scenario. Reference to the medium-high deficit is certainly unnecessary and probably misleading, and should be stricken from the final report. The text in the final report should also reflect the fact that the dams' power output represents less than 1.1 percent of this expected medium load deficit.

432 The treatment of replacement resources maintains an exclusively regional scope, and ignores any and all local opportunities such as conservation and/or cogeneration at the Daishowa mill and/or by electricity consumers of the City of Port Angeles utility. With the pending retirement of the Elwha River dams, BPA can and should pursue cost effective, local replacement resources. Instead, the current text reads, "Because of the small size of these projects compared to BPA's expected generating resource acquisition needs, it is unlikely that BPA would undertake specific actions to replace the lost power" (p. 121-122). The relatively small size of the dams' power output should make local replacement all that more attractive because of its probable feasibility.

The text continues, "Rather, the ongoing acquisition of projects would be slightly advanced in time to cover the need created by the Elwha retirements" (p. 122). If BPA does not pursue specific local replacement options, this statement is true.

In which case, the methodology for calculating cost of replacement power is entirely false. The current discussion compares the present value of power over a 40-year period generated either at the dams or at replacement resources. If the dams' retirement in 1997 would advance in time the ongoing acquisition of regional

power resources, as asserted earlier in the text, then the appropriate and proper approach for calculating the cost of replacement power is to estimate the probable cost of 18.7 average megawatts of new power supply resource in the year 1997 - definitely not over a 40-year period.

We want to know what BPA will spend on replacement resources when the Elwha dams go off-line in 1997. Instead, the methodology in the current discussion tries to answer the question "What costs would BPA avoid if the agency didn't have to replace the Elwha dams?" If we are going to pursue this latter, irrelevant question, then the calculation must include the costs of operating the two dams beyond the year 1997. Instead, the text states, "No mitigation costs for licensing Elwha or Glines Canyon were included in the base case and no decommissioning costs or foregone operation and maintenance costs were included in the alternative case" (p. 122).

The Northwest Power Planning Act directs the BPA to acquire cost-effective conservation, renewable, and cogeneration resources before relatively expensive thermal power plants fired by fossil fuels. If BPA is following the law, the agency in 1997 would have far more conservation (and other highly cost-effective resources) available for acquisition than it would over the following 40 years. Indeed the text states, "Replacement resources were drawn from the stack of resources. . .(Table 11) in order of cost-effectiveness" (p. 122). But under the current methodology, the replacement resources were drawn from the stack over a 40-year period rather than just in 1997 when the dams go into retirement.

This error has two unacceptable consequences in the draft report. First, the estimated cost of replacement power runs much higher than what BPA will actually experience. In 1997, the stack of available resource options will still contain such large amounts of relatively inexpensive conservation that BPA's actual costs to replace the Elwha dams at that time will fall at or near the lower end ($20 million) of the range offered in the draft report. In the Elwha legislation (P.L. 102-495), the dams' owners receive $29 million for replacement power. I see no compelling reason whatsoever to believe that this "marketplace assessment" of replacement power costs is inaccurate.

Second, because conservation will be the replacement resource of choice, the environmental impacts, particularly on air quality, will be considerably smaller than the estimates which appear in the draft report.

For the final report, I would respectfully suggest the following changes in the text:

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1) Strike all reference to medium high load forecasts.

2) Note that options are available in the Port Angeles vicinity to capture conservation and cogeneration as replacement resources.

3) Strike the entire discussion under "2. Cost of Replacement Power." In its place, note that P.L. 102-495 would provide $29 million to the dams' owners in replacement for the projects' power supply. Sauce for the goose is still sauce for the gander, and BPA will probably incur similar costs to replace the dams' output upon their retirement in 1997.

4) Strike the entire discussion under "3. Environmental Consequences" with the exception of the first paragraph. In the first paragraph, strike the sentence: "The resulting releases of key air pollutants and carbon dioxide can be estimated" (p. 122).

Alternatively the preparer(s) of the analyses provided in this section of The Elwha Report (presumably the Northwest Power Planning Council and/or the Bonneville Power Administration) should recalculate costs and consequences of replacement power incorporating the assumptions recommended in this memorandum.

3006 S. Peabody
Port Angeles, WA 98362
(206) 452-4847

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PORT [illegible]

11.6.93

Mr. Brian Winter
Elwha Restoration Interagency Team
Olympic National Park
600 E. Park Ave.
Port Angeles, WA 98362

Dear Mr. Winter:

I wish to express my strong support in favor of removing the two dams on the Elwha River. Both good science and good public policy demand that the dams be eliminated.

On the scientific side, the evidence establishing the harm the dams have done to the salmon runs is undeniable. Moreover, the evidence also shows that the proposed alternatives to dam removal, such as fish ladders and fish trucking, are ineffective.

Regarding public policy, since the Bonneville Power Administration is typically awash in surplus energy which it sells to other regions of the country, it seems that the dams have outlived their once useful purpose. Moreover, the dams must eventually be removed, for it is inevitable that the lakes behind the dams will silt in. Postponing their removal will only make the project more costly.

As a further public policy consideration, it is now clear that the economic future of the northern peninsula lies in recreation and tourism rather than in cutting trees. Removing the dams can only help achieve this future by providing the sort of fishing and rafting opportunities that people now travel to Alaska for. Moreover, federal funds to eliminate the dams would provide an important short term stimulus to an area that is severely depressed.

For these reasons, I hope that the Elwha River will soon be restored to its once wild and free state.

Sincerely,

Thomas R. Grimes

Thomas R. Grimes, Ph.D.

October 29, 1993

Mr. Brian D. Winter
Team Leader
Elwha Restoration Interagency Team
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362 - 6757

Regarding: Public Comment on Removal of Elwha Dams.

Dear Sir,

I wrote to you a few weeks ago stating that I was in favor of removing the two dams on the Elwha River. One of the reasons I offered was the probability of massive earthquakes from infrequent time to infrequent time.

Enclosed for your review are photographs of the west canyon wall just below the upper dam. You can see a fault or crack line running up from right to left.

If you take the top photo, just put it off to the side. Then the next four overlap each other and it is fairly easy to arrange them simply start with the one on top and put it down in front of you. The next one goes on its left and up a bit, and you can fit the boulders together. Then Scotch tape the two. The third merely goes over the second on the left side of the second. Tape it. The fourth sets down on the left, too, higher up, and when it all is taped together, the canyon floor is on the right and the dam can just be seen at the top left. The point is to show the crack-line in the canyon wall itself. A person who lives near the dams was yelling in my ear that the upper canyon that holds the dam was solid rock - and just in case the same person yells in your ear - you can show him the photos and ask him if that is his idea of solid rock.

Actually the photos are probably unnecessary. The geology of the Olympic Peninsula is already a known factor. I was reminded of that on the day before yesterday when walking on the asphalt trail on Hurricane Ridge leading to Hurricane Hill. I remembered a trail sign that used to be there stating that the lines of black in the rock, right there at about 5,400 feet elevation, were of petrified mud. Must be some seismic play to raise mud 5,400 feet. On that day my son and I bushwacked down the west fork of Wolf Creek to the Elwha road, walked another three miles to the nearest pay phone and then hired a cab for fifty dollars to take us back to our vehicle on the ridge.

I will be glad when the dams are gone and the river is opened to the free run of salmon.

Very truly yours,

Calmar A. McCune
PO Box 845
Port Townsend, Washington 98368

WASHINGTON STATE DEPARTMENT OF
Natural Resources

JENNIFER M BELCHER
Commissioner of Public Lands

KALEEN COTTINGHAM
Supervisor

November 7, 1993

Brian D Winter,Ph.D
Team Leader
Elwha Restoration Report
National Marine Fisheries Service
Office of the Regional Director, F/NWR
7600 Sand Point Way N.E
Bin C15700
Seattle, WA 98115

Re The Elwha Report

Dear Dr Winter

I am responding to your request for comment on the content of the Report of the Federal Energy Regulatory Commission on removal of the Elwha and Glines Canyon Dams

I believe that the report is now responsive in a very cursory way to the concerns I have raised in earlier drafts to impacts on the marine environment Given that the report now states that the delta will be move 5 miles seaward warrents a clearer understanding of the marine environmental impacts It is clear that field work in the area is needed to develop the information needed to identify all of the possible impacts

Thank you for the opportunity to comment

Sincerely yours,

David W Jamison, Ph D
Senior Marine Scientist
Division of Aquatic Lands

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ITT

ITT Rayonier Inc.

Seattle Office

Donald L. Schwendiman
Regional Counsel
Assistant Secretary

November 8, 1993

VIA OVERNIGHT MAIL

Brian Winter
Elwha Restoration Interagency
  Team Leader
Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

Re: Comments on Public Review Draft of the Elwha Report

Dear Mr. Winter:

The following are ITT Rayonier's comments on the Public Review Draft of the Elwha Report on restoration of the Elwha River Ecosystem and Native Anadromous Fisheries.

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1. In Section VI.E.6. of the Report at page 93, under the section entitled "City of Port Angeles Industrial Supply" the report states:

> A number of alternatives have been considered to meet the needs of the City's primary industrial water users (Daishowa America and ITT Rayonier). Of these, only three meet the test of providing for remaining industrial water users.

It appears that an inappropriate test has been applied here to artificially limit the options being considered. In the first place, there are no "remaining industrial water users" of the City of Port Angeles industrial supply system. The City's industrial supply waterline serves only Daishowa America and ITT Rayonier. The only other user of water from the diversion is the WDF hatchery. Secondly, there is no requirement in public law 102-495 to apply such a test.

18000 International Boulevard, Suite #900, SeaTac, WA 98188-4283
Mailing Address: P.O. Box 34162, Seattle, WA 98124-1162
Telephone (206) 248-3400 FAX (206) 248-4117

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The second sentence quoted above should be deleted from the draft report and the two alternatives set forth in the CH$_2$M Hill report of June 18, 1991, which was previously provided to you and to FERC, should be included in the draft report. A copy of the CH$_2$M Hill report is attached to this letter.

2. It appears that the anticipated mitigation costs in table 9 of the draft report fail to include the cost of land fill facilities to handle the sediments removed from the river water under alternatives (1) and (3), or the cost of leachate treatment from those land fill facilities. As indicated in the June 18 CH$_2$M Hill report, the cost of disposal of the excess sediments removed from the river water are a significant cost of the total project ($9.3 million). Those costs should be added and table 9 should be expanded to include the alternatives set forth the CH$_2$M Hill report.

Please include these changes in the final report.

Very truly yours,

Donald L. Schwendiman
Regional Counsel Northwest

/jkb
encl.

cc: R. Daniel
    Daishowa America
    D. Reed

CH2M
Engineers
Planners
Economists
Scientists

June 18, 1991

SEA32082.A0

Mr. Brian Jones
Environmental Superintendent
ITT Rayonier Inc.
Port Angeles Pulp Division
P.O. Box 191
Port Angeles, WA 98362

Mr. Dean M. Reed
Engineering Manager
Daishowa America
Port Angeles Mill
P.O. Box 271
Port Angeles, WA 98362

Dear Brian and Dean:

Subject: Impacts on the ITT Rayonier and Daishowa Pulp Mill Water Treatment Systems due to the Elwha River Dams Removal

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EXECUTIVE SUMMARY

This letter report summarizes CH2M HILL's investigation of water treatment requirements if the Elwha river dams are removed. Two alternatives were analyzed -- modification of water treatment facilities at each mill and a single treatment facility near the river water intake. For both alternatives, a dedicated landfill for solids disposal was sized.

Modifications to Existing Water Treatment Systems

If the mill treatment systems are modified, a new flocculation and settling basin and a solids dewatering system would be added to the ITT Rayonier facility. At the Daishowa mill, the existing settling basin would be modified to allow automatic withdrawal of settled solids, and a solids dewatering system would be added. Area requirements for the added systems would be about 2 acres at ITT Rayonier and 2,000 square feet at Daishowa. According to plant personnel, this amount of area is not available adjacent to the existing treatment systems.

A single landfill would be constructed for solids disposal from both mills. The landfill would be double-lined with a leachate collection system. Leachate from the landfill would be collected at the landfill site and treated for metals removal prior to discharge. The estimated leachate volume is an average of 20,000 gallons per day with peak storm volumes in excess of 250,000 gallons per day. Assuming a 20 year minimum life, the landfill area required is about 42 acres, including a 2-acre leachate collection pond (double-lined).

Estimated capital costs for the modifications are summarized in Table 1. Total estimated capital costs are $12.9 million at ITT Rayonier and $2.2 million at Daishowa. In addition to these costs, the estimated cost of the new landfill, including leachate collection and treatment, is $9.3 million. These costs do not include the cost of purchasing land.

TABLE 1
CAPITAL AND O&M COST SUMMARY

CAPITAL COSTS ($1,000)	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT SYSTEM AT RIVER
SOLIDS SETTLING AND DEWATERING	12,900	2,200	15,100	16,500
LANDFILL AND LEACHATE TREATMENT	—	—	9,300	9,300
LAND PURCHASE[a]	Undefined cost	Undefined cost	Undefined cost	Undefined cost
TOTAL PROJECT COSTS	12,900	2,200	24,400	25,800
O&M COSTS[b] ($1,000/YEAR)	1,685	535	2,240	2,425

[a] Costs for purchase of land to expand mill treatment systems and for the landfill would be significant. Because the landfill location has not been determined and because of the variability in land costs, these costs were not estimated for this evaluation.

[b] For in mill treatment, the costs shown are increased costs above current O&M costs. Leachate treatment and solids transfer costs are included.

The estimated increase in yearly O&M costs is $1.7 million per year at ITT Rayonier and $500,000 per year at Daishowa. Of the total increase of $2.2 million per year for both mills together, over a third is due to the cost of hauling solids to the landfill.

MWTR:Letter/[illegible]

New Treatment Facility Near the River Intake

The new facility located near the river intake would consist of alum addition followed by flocculation and solids settling in a settling basin. Solids would be pumped from the settling basin to a solids dewatering facility, consisting of a solids thickener and belt presses. Area requirement would be about 2.5 acres.

A landfill with an area of about 42 acres would be required for solids disposal, assuming a 20 year minimum life. The landfill construction would be identical to the landfill that would be used if both mills modified their water treatment systems.

Estimated capital costs and O&M costs for the new facility are compared to the plant modification costs in Table 1. Total estimated capital costs for the treatment facility are $16.5 million. For the new landfill, including leachate collection and treatment, the estimated capital cost is $9.3 million. Estimated O&M costs are $2.4 million per year; of this amount, over one-third is due to the cost of hauling solids to the landfill.

Alternatives Comparison

Given the accuracy of the cost estimates, both alternatives have equal capital and O&M costs.

Although costs are equal, a single treatment system near the river intake has significant advantages over modification of the existing water treatment systems at the mills. These advantages include:

- The water pipeline to the mills would be protected against siltation that could occur during low flow periods (if one or both mills were shut down for maintenance, for example).
- If process upsets occur at the new treatment system, the mill's existing treatment systems could polish the water flowing to the mills. If treatment is done only at the mills, no backup treatment would exist.
- The new treatment facility could be used to pretreat water for the City of Port Angeles. If so, economy of scale could reduce the overall cost of water treatment for the mills and City combined.

Based on this comparison, a single treatment system near the river intake would be a better selection if the dams are removed.

BACKGROUND

The Federal Energy Regulatory Commission (FERC) has proposed removal of the two dams on the Elwha river in an attempt to reestablish wild salmon runs in the river and upstream tributaries. FERC completed a draft environmental impact statement (DEIS) that discusses the environmental impact of dam removal and also the impact of leaving the dams in place. The DEIS recognized that river water quality would be diminished due to increased suspended solids concentration during and after dam removal. However, a thorough investigation into the affect of the diminished water quality on the City of Port Angeles and the ITT Rayonier and Daishowa pulp mills, which draw their water supply from the Elwha river, was not provided in the DEIS.

In order to evaluate water quality impacts thoroughly, CH2M HILL was contracted by ITT Rayonier and Daishowa to investigate the affect of the diminished water quality on their water treatment systems. This investigation focused on treatment system improvements that would have to be made to meet the treated water quality requirements of the mills. Capital costs, operating and maintenance (O&M) costs, and area requirements were determined for two alternatives - a single water treatment system near the river water intake, and modification to the mill water treatment systems. In addition, because of a significant increase in solids removed from the raw water, requirements for a dedicated solids disposal landfill were also developed.

The analysis presented in this report has been limited by the amount of information available on the water quality of the Elwha river if the dams are removed. Conclusions reached, however, confirm significant impact on the operation of each mill resulting from removing the dams. It is clear that the analysis of these impacts included within the DEIS did not fully recognize the water quality concerns or potential financial impacts of the dam removal proposed.

RIVER WATER QUALITY

The present suspended solids concentration (TSS) in the river water supply to the mills is determined daily by ITT Rayonier from 24-hour composite samples. Daily TSS concentrations from January 1, 1990 through March 31, 1991 were used to determine the frequency of occurrence at various TSS concentrations. These results are shown in Table 2. TSS levels are less than 15 mg/l about 80 percent of the time and less than 100 mg/l about 95 percent of the time.

The expected TSS concentration during and after dam removal was discussed in the DEIS in Section 4.2.2.1 (construction impacts on water quantity and quality). The dam removal period would last for 5 years, and water quality impacts could be expected for another 5 years after dam removal. TSS concentrations of 300 to 500 mg/l are expected to occur throughout the summer construction period (an 8-month period from March through October). These TSS levels are also expected during winter storm events, which would occur on an estimated 35 days during the winter months. The expected TSS concentrations are compared to current levels in Table 2. This comparison shows that increased TSS levels will be substantial.

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The DEIS also mentions TSS levels in Section 4.2.1.1 (construction impacts on river morphology). TSS concentrations of 7,000 to 14,000 mg/l could be expected when upstream river banks slump into the river. For this evaluation, the expected TSS levels shown in Table 2 were used as a daily average. It was assumed that the much higher TSS concentrations resulting from slumping would occur intermittently for short periods of less than a day.

After 10 years (including the 5 year dam removal period), sediment load in the river is expected to decrease to levels typical of rivers in the area. Quantitative estimates of TSS concentration were not made in the DEIS. However, the expected sediment load at the mouth of the river was estimated to be an average of 209,000 cubic yards per year (Section 4.2.1.2, long-term impacts on river morphology). At an average flow of 1,506 cfs, this sediment load is equivalent to a TSS concentration of about 150 mg/l, which is about one-half of the expected TSS concentration during the dam removal period. Because much of the sediment load would occur during storm periods, peak TSS concentrations would be much greater than the average.

Although lower in the long term than during dam removal, the river TSS concentration would still be at levels that would require continued treatment by new or modified water treatment facilities. Therefore, the use of temporary treatment facilities, which would be operated only

TABLE 2
RAW WATER TSS CONCENTRATIONS

RAW WATER TSS CONC. (MG/L)	EXISTING WATER QUALITY		EXPECTED WATER QUALITY	
	NUMBER OF OCCURRENCES[a]	PERCENT	NUMBER OF OCCURRENCES[a]	PERCENT
0	10	2.3		
5	256	59.7		
10	50	11.7		
15	25	5.8	90[b]	25
20	15	3.5		
25	14	3.3		
50	21	4.9		
75	7	1.6		
100	9	2.1		
150	7	1.6		
200	7	1.6		
300	3	0.7		
500	2	0.5	275	75
700	1	0.2		
1,000	2	0.5		
TOTAL	429	100	365	100

[a] As an example, a measured TSS concentration of 400 mg/l would be included in the count for 500 mg/l because it is greater than 300 mg/l but less than 500 mg/l.
[b] Assumed value.

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EXISTING WATER TREATMENT SYSTEMS

The ITT Rayonier and Daishowa mills have similar water treatment systems. Pertinent data on the two treatment systems are summarized in Table 3. Both mills add alum and polymer to the raw water, settle the solids in a settling basin, and then filter the basin overflow.

TABLE 3
EXISTING MILL WATER
TREATMENT SYSTEMS

	ITT RAYONIER	DAISHOWA
FLOW (MGD)	32	7.2
SETTLING BASIN RETENTION TIME (HR)	1.0	4.3
SETTLING BASIN RISE RATE (GPM/FT^2)	1.8	0.4
CHEMICAL ADDITION	Yes	Yes
AUTOMATIC SOLIDS REMOVAL FROM SETTLING BASIN	No	No
FILTRATION RATE (GPM/FT^2)	2.2	2.2
TARGET WATER QUALITY (MG/L)	0.015	2.5

Solids are allowed to accumulate in the settling basins and are periodically pumped out after draining the basins. The Daishowa mill removes solids only once per year, and the solids are flushed directly to the Strait of Juan de Fuca.

The ITT Rayonier mill removes solids about 2 to 3 times per year during mill shutdown periods, which occur twice per year, and sometimes between mill shutdowns. Solids are transported using tanker trucks to the ITT Rayonier landfill for disposal. Solids removed between mill shutdowns must be pumped from the settling basins while keeping them in operation because removal of one of the settling basins from service would result in unacceptable treated water quality.

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The treated water quality at the Daishowa mill typically has a TSS concentration of less than 2.5 mg/l. A TSS concentration greater than 4 mg/l may cause operating problems (plugged nozzles, for instance) in the mill and may reduce the quality of the directory paper produced by the mill. Continued exposure of machinery to high TSS concentrations accelerates wear and increases maintenance.

At ITT Rayonier, the treated water TSS concentration is usually less than 0.015 mg/l TSS. A TSS concentration above 0.05 requires extra testing of the pulp product and quite often results in lower quality and lower value pulp.

Water quality concerns at the ITT Rayonier and Daishowa mills related to product quality are discussed further in the next section.

IMPACT OF HIGH TSS LOADS ON THE EXISTING TREATMENT SYSTEMS

As was shown in Table 2, high TSS concentrations will become nearly an every day event if the dams are removed. Currently, TSS levels exceed 300 mg/l 3 or 4 days per year. During and after dam removal, this TSS level would be exceeded 275 days per year. Although both mills can respond to high TSS levels by increasing chemical addition on an interim basis, treated raw water quality will often exceed target levels during these occurrences. Prolonged operation at these high levels would likely result in unacceptable treated water quality at times.

Water quality is particularly important at the ITT Rayonier mill because they produce unique, high purity chemical cellulose pulps. These pulps are converted by ITT Rayonier's customers into products such as photographic film, plastics, yarns and filaments, food additives, filters, and adsorbent mediums. The pulps must be essentially free of metals and minerals to satisfactorily perform in these end-uses. Therefore, it is critical that the quality of all raw materials used in pulp manufacturing, including incoming water, be controlled to strict standards.

As was mentioned in the previous section, the ITT Rayonier mill currently maintains the treated water TSS concentration at an average of 0.01 mg/l year round. TSS excursions above 0.05 mg/l requires extra testing of the finished pulp and quite often results in lower quality and lower value pulp. Water with high TSS concentrations contains excessive amounts of extraneous materials, mostly silica, which produce pulps that cannot be successfully used by ITT Rayonier's customers due to one or more of the following reasons:

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- Unpredictable chemical reactions yielding inferior or unacceptable products
- Physical impurities that plug up process equipment, resulting in production losses
- Poor quality in products due to extraneous materials, including fiber weakness in yarns and cigarette filters and contamination in plastics, films, specialty papers, and food and drug additives
- Excessive wear on customers' processing equipment (particularly a problem in fluff pulping)

Although water quality requirements at the Daishowa mill are not as stringent as the ITT Rayonier mill, maintaining water quality is also vitally important in order to maintain acceptable finished paper quality. The Daishowa mill produces some of the highest-quality directory paper in North America. Daishowa has contracted with their customers to provide paper that is clean and free of dirt specks and other imperfections.

The use of full color advertising in telephone directories, which requires that the paper have a very clean appearance, is increasing. Dirt content in the water must be kept at low levels to maintain this clean appearance. Bleach is used to mask any dirt that carries through to the finished paper, and an increase in dirt content would place a greater demand on the bleaching system. A major concern is the ability of the existing bleaching operation to handle higher dirt loads. With increasing TSS concentration in the water supply, operational upsets and unacceptable paper quality would undoubtedly occur as the load on the bleaching system increases.

For these reasons, good water quality is essential at ITT Rayonier and Daishowa so that they may continue to supply the high quality pulps and directory paper required by their customers.

In addition to unacceptable water quality, the large increase in solids removed by the settling basins would make the current method of solids removal impractical. Assuming 400 mg/l TSS removal, the settling basins at ITT Rayonier would be completely full in only 7 days. If the basins are pumped out when the settled solids accumulate to a depth of 2 feet, solids would have to be pumped 144 times per year compared to 2 to 3 times per year now. At Daishowa, the settling basin would be completely full in about 28 days and would have to be pumped out 34 times per year.

Increased solids loads would result in an increase in the frequency of filter backwashing because the TSS concentration
of the settling basin effluent would increase. Currently, the filters are backwashed every two to three days with a typical influent TSS load. At this backwash frequency, the estimated average backwash volume is about 1.5 percent of the total flow or 0.6 mgd for both mills.

With increased TSS concentration, the backwash frequency and the amount of water required for backwashing will increase. Based on filter operation during November, 1990, when the raw water TSS concentration was comparable to future predicted levels, the typical backwash frequency would increase to about once every 10 hours. With this backwash frequency, the total backwash volume for both mills would be about 4.7 mgd, which is 12 percent of the raw water flowing to the mills. The increased backwash water requirement would result in increased consumption of river water of over 4 mgd. This increased consumption would be a concern primarily during the summer when river water flows are already low.
In addition to the increased backwash volume discharged, the amount of solids discharged would also increase. The weight of solids discharge would increase from about 3,800 pounds per day to 31,000 pounds per day. This large increase in solids discharged directly to the strait, untreated, may require that the existing NPDES permits for both facilities be opened and reviewed. Ecology or the EPA may require that the facilities change the manner in which backwash solids are disposed, which would significantly increase treatment costs. In addition, at ITT Rayonier, the increased solids load may cause plugging problems in the plant wastewater discharge line.

Because filtered water taken from the mill water supply tank is used for backwashing, frequent backwashing can threaten the mill water supply if the filters must be backwashed one after another. Depletion of the mill water supply has almost occurred at ITT Rayonier during past instances when TSS concentrations were at peak levels.

In addition to the increased frequency of filter backwashing, the increase in the filter influent TSS concentration could result in higher effluent TSS concentrations. Past experience at ITT Rayonier has shown that poor filtered water quality is often due to increased influent TSS concentrations.

MODIFICATIONS TO EXISTING TREATMENT SYSTEMS TO ACCOMMODATE REDUCED WATER QUALITY

After consideration of the potential operating and permit problems caused by the increased solids load, the following modifications to the existing treatment systems were assumed necessary:

- A settling basin at ITT Rayonier with a 4-hour retention time and a rise rate of 0.5 gpm/ft^2. The basin would have automatic solids removal equipment (sludge collectors, sumps, and pumps). A rapid mix section and flocculating basin ahead of the settling basin would also be necessary.
- A solids removal system installed in the existing settling basins at Daishowa to automatically remove solids.
- For both mills, a solids dewatering system and truck loading station for offsite disposal of solids. The solids dewatering system includes a gravity thickener, thickened solids pumps, a storage tank for thickened solids, belt presses, belt press feed pumps, and a polymer system.
- Minor modification to the chemical feed systems to increase capacity.

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New Equipment Sizing and Area Requirements

New equipment and tanks were sized assuming 500 mg/l raw water TSS concentration. It was also assumed that the entire plant water supply would be treated in the settling basins (some of the water to the mills is currently bypassed around the treatment system). Equipment and tank sizing is summarized in Table 4. Additional assumptions used for sizing are also shown.

Use of the existing flocculation and settling basin at ITT Rayonier in combination with new settling basins was considered. Although a detailed evaluation was not done, the layout of the existing treatment system and the size of additional settling volume would make the use of the existing flocculation and settling basins impractical if not impossible. Therefore, it was assumed that the new flocculation and settling basin would provide all solids settling for the modified facility.

TO Don Schwendiman
Wendy Pugnetti
1 of 1

At ITT Rayonier, the area required for the new settling basin and other facilities is about 2 acres. At Daishowa, about 2,000 square feet would be required. According to mill personnel, adequate area is not available adjacent to the existing treatment systems. Purchase of land would likely be necessary, and the new facilities could be a significant distance from the existing treatment systems. Location of the new facilities some distance from the existing facilities would result in increased equipment requirements (such as transfer pumps from the new settling basin to the existing filtration system) and cost.

The size of the settling basin at ITT Rayonier could be reduced by using tube settlers to enhance settling. Based on our experience, the overall cost of a settling basin with tube settlers is about equal to the cost of a settling basin without tube settlers. If a new settling basin is added to the ITT Rayonier treatment system, the use of tube settlers should be evaluated.

TABLE 4
MODIFICATION TO MILL WATER TREATMENT SYSTEMS

	ITT RAYONIER	DAISHOWA
FLOCCULATING BASIN (GALLONS)	880,000*	NOT NEEDED
SETTLING BASIN (GALLONS)	7,000,000*	NOT NEEDED
SOLIDS REMOVAL	INCLUDED WITH NEW SEDIMENTATION BASIN	ADDED TO EXISTING SEDIMENTATION BASIN
THICKENER DIAMETER (FEET)	50*	25*
THICKENED SOLIDS STORAGE TANK (GALLONS)	150,000*	35,000*
BELT PRESSES	4,2-METER*	2,1-METER*
POLYMER SYSTEM (LB/HOUR)	25*	6*

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- ª 30 minute retention time
- ᵇ 4 hour retention time, 0.5 gpm/ft² rise rate
- ᶜ 0.5 gpm/ft² rise rate, 1.5 percent solids from settling basin
- ᵈ 16 hour storage, 10 percent solids from thickener
- ᵉ 2,000 lb/hour solids per meter of belt press width, 8 hour per day operation
- ᶠ 3 pound polymer per ton solids

Solids Disposal and Landfill Sizing

A dedicated landfill was sized to dispose of the additional suspended solids generated as a result of dam removal. The landfill area required was estimated based on a 20-year minimum life, 50 percent solids to disposal, and a 20-foot depth. For both mills together, the area required is 40 acres. The 20 year minimum life would occur if solids loads remained at peak levels for 20 years. Assuming the solids load decreases by one-half after 10 years, the expected life of the landfill is about 30 years.

The landfill would be constructed with a double liner and a leachate collection system. Leachate would be collected during storm events in a two-acre retention pond for subsequent treatment. Based on an active area of 10 acres, the estimated leachate volume is about 20,000 gallons per day on average (yearly basis), with peak volumes of over 250,000 gallons per day during storm events. During the winter, average leachate volume would be about average twice the yearly average or 40,000 gallons per day.

Depending on the location of the landfill, discharge of the leachate to the City of Port Angeles POTW may be possible. In this case, pretreatment of the leachate prior to discharge may be necessary. The more likely scenario is that the landfill would be a significant distance from the POTW sewer system so that onsite treatment to meet water quality criteria would be necessary prior to discharge.

Based on the estimated level of organic material in the river sediment (given in the DEIS), the organic load and resulting organic biodegradation in the landfill would be much less than what occurs in a conventional landfill. Therefore, organic and BOD concentrations in the leachate should be low. Metal concentrations, on the other hand, could be greater than a conventional landfill. Because alum would be used for sedimentation, aluminum concentrations in the leachate would require treatment. Other metals, such as iron and manganese, may also require treatment. For cost estimation, it was assumed that treatment to remove metals would be necessary and that biological treatment would not be necessary.

If biological treatment is necessary, capital costs would be about twice the cost for metal removal only.

About 58,000 tons or 61,000 cubic yards of solids per year would be disposed of in the landfill. This volume of solids disposal would require over 6,000 truck loads per year at 10 cubic yards per truck.

Capital and O&M costs for the mill modifications were developed and are discussed in the cost section.

WATER TREATMENT NEAR THE RIVER WATER INTAKE

As an alternative to providing all raw water treatment at the mills, TSS could be removed using a new facility located near the river water intake. This facility would treat raw water for both mills to a level consistent with the current raw water quality.

The treatment system would consist of alum addition followed by a rapid mix section, a flocculation basin, and a settling basin. Solids would be automatically removed from the settling basin and dewatered using belt presses.

The use of an existing channel passing near the fish hatchery was considered for solids removal. This channel is 2,100 feet in length and 30 to 40 feet wide. Review of the raw water TSS level to the mills indicates that the channel does not routinely remove solids to low levels. The TSS concentration, as shown in Table 2, can be quite high leaving the channel, indicating that appreciable solids settling does not always occur. Therefore, it was assumed that the channel could not be used for solids settling.

Equipment and tank sizing was based on an average raw water TSS concentration of 500 mg/l. Influent flowrate was assumed to be the sum of the two mill's water requirement.

It was assumed that dewatered solids would be trucked to a landfill. Discharge of solids directly from the settling basin, which would eliminate the dewatering system, would be in violation of state water quality standards because of the aluminum and TSS load added to the river.

The landfill area required for this alternative is the same as for both mills together. The treatment system would require an area of about 2.5 acres, primarily for the settling basin. The area requirement could be reduced by using tube settlers in the settling basin. However, the overall cost would be about the same.

The equipment and tank sizes for this alternative are summarized in Table 5. Assumptions used for sizing are also shown.

TABLE 5 NEW WATER TREATMENT SYSTEM NEAR RIVER WATER INTAKE	
FLOCCULATING BASIN (GALLONS)	1,100,000[a]
ALUM SYSTEM (LB/HOUR)	550[b]
SETTLING BASIN (GALLONS)	8,500,000[c]
THICKENER DIAMETER (FEET)	55[d]
THICKENED SOLIDS STORAGE TANK (GALLONS)	190,000[e]
BELT PRESSES	5,3-METER[f]
POLYMER SYSTEM (LB/HOUR)	40[g]

[a] 30 minute retention time
[b] 30 mg/l dosage
[c] 4 hour retention time, 0.5 gpm/ft² rise rate
[d] 0.5 gpm/ft² rise rate, 1.5 percent solids from settling basin
[e] 16 hour storage, 10 percent solids from thickener
[f] 2,000 lb/hour solids per meter of belt press width, 8 hour per day operation
[g] 3 pound polymer per ton solids

CAPITAL AND O&M COSTS

Order-of-magnitude capital cost estimates were developed using cost curves for solids handling (AWWA Handbook of Water Treatment Plant Waste Management) and CH2M HILL experience for settling and flocculation. Capital costs for each mill are compared to the capital costs for a single water treatment system near the river in Table 6. These costs include equipment purchase and installation, site preparation, engineering, contractor's costs, and administrative costs. They do not include costs for land purchase, which could significantly increase overall project costs. Given the level of accuracy of the cost estimate, the capital cost of the single treatment plant at the river is equal to the capital costs for modifications to both mill treatment systems together.

TABLE 6
TOTAL PROJECT COST
COMPARISON ($1,000)

	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT SYSTEM AT RIVER
SOLIDS SETTLING	8,900	400	9,300	10,700
SOLIDS DEWATERING	4,000	1,800	5,800	5,800
SOLIDS DISPOSAL (LANDFILL)[a]	—	—	8,000	8,000
LEACHATE TREATMENT[b]	—	—	1,300	1,300
TOTALS	12,900	2,200	24,400	25,800

[a] Assuming solids level in the river remains high during the entire 5 year dam removal period and 5 years after the dams are removed, then solids level decreases by one-half.

[b] Assuming metals removal only. If biological treatment is required, costs would double.

Messrs. Jones and Reed
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O&M costs are compared in Table 7. Assumptions used to estimate these costs are also shown. Most of the operating cost is due to chemical costs and hauling costs to transport solids to the landfill. Hauling cost depends on the distance to the landfill. Potential locations for a landfill were not determined; therefore, these costs will likely vary from those shown.

TABLE 7
O&M COSTS ($1,000/YEAR)

	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT AT RIVER
CHEMICALS	430[a]	150[a]	580	800[b]
MAINTENANCE[c]	260	40	300	300
LABOR	190[d]	190[d]	380	350[e]
POWER[f]	8	2	10	10
SOLIDS DISPOSAL[g]	760	155	915	915
LEACHATE TREATMENT[h]	40	10	50	50
TOTAL	1,690	550	2,240	2,425

[a] Increased chemical costs over current cost
[b] Chemical use at the mills may be reduced with water treatment at the river. If so, the net chemical cost (future minus current) would be less than the value shown.
[c] 2 percent of capital cost per year (new equipment only)
[d] 14 mandays per week added to existing labor, $30/hour
[e] 28 mandays per week, $30/hour
[f] Added power costs for new equipment, $0.04/kwh
[g] 20 mile round trip to landfill, $15/cy solids
[h] $6 per 1,000 gallons leachate

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ALTERNATIVES COMPARISON

Treatment near the river and modification of both mill's treatment systems would cost about the same in capital and O&M costs.

Although about equal in cost, treatment near the river has significant advantages over modified treatment at the mills. One advantage is that the pipeline from the river to the mills would be protected against siltation resulting from the additional solids in the raw water supply. Although siltation is not likely during normal flow, low flow that would occur when one or both mills are down for maintenance could result in significant siltation. Accumulation of solids in the pipeline could lead to reduced flow to the mills, requiring maintenance or modification of the pipeline. Since the mills would have to be down during pipeline modification, pulping operations could be severely affected.

In addition to protection against pipeline siltation, treatment near the river would reduce the risk of unacceptable water quality at the mills. If an upset conditions occurs at the river treatment plant, the existing mill treatment systems would be able to further polish the water flowing to the mills. If treatment is done only at the mills, no backup treatment would exist.

Another potential advantage of a facility located near the river is that the facility could also be used to produce partially treated water for the City of Port Angeles. The City could then further treat the water using filtration to meet the City's domestic water requirements. Although this alternative has not been fully analyzed, there are potential economies of scale should the City determine that filtration would be necessary for their domestic water supply.

Based on this comparison, a single treatment system near the river would be a better selection for necessary water treatment if the dams are removed.

Sincerely,

CH2M HILL

Mark W. Davis

Mark W. Davis, P.E.

cc: Harry E. Grant/Riddel, Williams, Bullitt, and Walkinshaw
Norm Ward/CH2M HILL
Don Wright/CH2M HILL
Bob Rossin/CH2M HILL

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Dry Creek Water Association, Inc.

93 NOV -9 PM 1:29

November 5, 1993

Ms. Maureen Finnerty
Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362

Dear Ms. Finnerty:

We would like to thank you for giving us another opportunity to submit comments pertaining to the Elwha River Ecosystem and Fisheries Restoration Act.

The Dry Creek Water Board of Trustees reviewed the Elwha Report (Public Review Draft, September 1993) and found that document quite inadequate relating to mitigation measures pertaining to the Association's watershed. We feel that the cost estimates are grossly underestimated and that mitigation measures concerning flooding, sedimentary deposits in the river, filtration, and cost of obtaining rights to a new site suited for well location have not been addressed within this or previous reports (EERC, Summit Technology) only reconnaissance reports. An on-site survey of our facilities has never been conducted.

We can not understand how the federal government can outline reliable mitigation alternative costs for water quality users on the Elwha River without a thorough in-depth water comprehensive impact study not be completed. The Elwha Report states that "near-term and long-term operation, maintenance, replacement, and power costs would be evaluated during the EIS/advanced planning stage" which we are hopeful that this will be completed since this has been our concern from the very beginning. Once water quality issues are actually identified through a EIS/advanced planning stage study then actual mitigation costs can be genuinely established for all water purveyors involved.

We hope that you will involve our Association when the time comes to study the entire water quality issues pertaining to removal of the dams off the Elwha River. Quality water and adequate supply are essential to our quality of life in our Dry Creek community.

Sincerely,

Edsel Williamson
Vice-President
Dry Creek Water Board of Trustees

cc: Robert Hamilton, Bureau of Reclamation
Brian Winter, National Marine Fisheries Service
Earl Johnson, Washington State Department of Health
Herb Armstrong, ABA Engineering
Congressman Norman Dicks
Senator Slade Gorton
Senator Patty Murray

1826 Edgewood Drive Port Angeles, WA 98362 (206) 452-2780

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JAMES RIVER CORPORATION
WAUNA MILL

November 8, 1993

Brian Winter, Ph.D.
National Marine Fisheries Service
7600 Sand Point Way, NE, Bldg. 1
Northwest Region
Seattle, WA 98115

re: **Report to Congress on Elwha River Restoration**

Dear Dr. Winter

This letter sets forth the comments of the James River Corporation on the Draft Report to Congress entitled "Restoration of the Elwha River Ecosystem & Native Anadromous Fisheries". That report is required by section 3(c) of the Elwha River Ecosystem and Fisheries Restoration Act ("Elwha Act"). Pub. L. No. 102-495. James River previously commented on the issues presented by the Report by letter of August 6, 1993.

James River believes that the draft Report satisfies the requirements of section 3(c) of the Elwha Act. All of the issues specified in the Act for consideration in the Report have been adequately addressed. The Report establishes a sufficient basis and justification for proceeding with acquisition of the Project in accordance with the Elwha Act requirements.

In general terms, James River agrees with the ultimate conclusion of the Report that Project removal is necessary for full restoration of the Elwha River ecosystem. In stating this position, James River does not agree with all of the biological assumptions and conclusions set forth in the Report. To the contrary, James River adheres to the various positions it has taken on fisheries biology and related issues in the Federal Power Act licensing proceedings for these Projects. James River's support of the conclusion that Project removal is required to achieve full ecosystem restoration is in no way intended to be an alteration of the positions it has asserted in the licensing context.

James River's principal general comment on the Elwha Report is that it needs to be revised to reflect more accurately the intent of Congress that the acquisition be accomplished expeditiously and as a federal action that is separate and distinct from dam removal. This intent is demonstrated by sections 3(b) and 3(e) of the Elwha Act, which treat acquisition as a distinct action which shall be undertaken upon the submission of a Report to Congress concluding that Project removal is necessary for full ecosystem restoration and the appropriation of funds for purchase of the Projects.

In addition to conforming with the intent of Congress, prompt Project acquisition will confer important benefits. Securing the Projects under federal ownership will allow immediate action to begin on measures that the fish and wildlife agencies have identified as necessary to protect the fishery and other ecological resources of the Elwha River watershed. Furthermore, it will ensure that the ultimate fate of the Projects will rest in the hands of the federal government. Prompt acquisition will also allow the federal government and interested parties to turn their attention to Project removal, as discussed in the Report. Finally, it will fulfill the intent of Congress that the economic interests of James River, Daishowa America, and the economy of the City of Port Angeles and Clallam County will be fully protected while efforts are undertaken to fully restore the Elwha River ecosystem.

In this regard, James River does not believe that an environmental impact statement ("EIS") under the National Environmental Policy Act ("NEPA") is required for project acquisition. As a threshold matter, acquisition of these Projects is mandatory upon the appropriation funds. As provided in section 3(e) of the Elwha Act, James River is required to convey the Projects upon the appropriation of funds and title vests in the United States without further action by the Secretary. Under this scenario, there is no action for the Secretary to take that allows for the application of discretion subject to NEPA. Sugarloaf Citizens Ass'n v. FERC, 959 F2d 508, 513 (4th Cir. 1992); Goos v. ICC, 911 F.2d 1283, 1293-95 (8th Cir. 1990).

Even if NEPA does apply, it is clear that the mere acquisition of the Projects does not have any adverse environmental impacts. The environmental impacts of Elwha River ecosystem restoration will result from Project removal, which is a discrete action the Secretary is not obligated to undertake even after acquisition. Indeed, by making possible interim mitigation programs pending final action on ecosystem restoration options, Project acquisition will bestow immediate environmental benefits.

Project acquisition cannot be deemed to be an irreversible and irretrievable action leading inevitable to dam removal. Under the "definite plan" required by section 3(c) of the Elwha Act, the Draft Report indicates that an EIS will be prepared on Project removal. Such an EIS must necessarily assess the environmental impacts of removal and its alternatives, including no action. If the negative impacts outweigh the benefits, the Secretary will have the discretion to not remove the Projects. Thus, even after acquisition a subsequent decision will be made whether or not Project removal is appropriate. That decision is in no way dictated by the acquisition of the Projects.

Finally, even if environmental review of the impacts of Project acquisition is necessary, it is clear that an environmental assessment and finding of no significant impact would suffice. This could be accomplished on an expedited basis through a Project-specific EA or context of NEPA compliance for the Olympic National Park's land protection planning process.

In addition to these general observations, James River has the following specific comments.

Page 64, Item 17

There is considerable confusion regarding the labeling, storage, and status of hazardous waste stored at the Glines and Elwha dam sites.

An empty 30-gallon steel drum, which once contained herbicide mixture including 245-T, has been stored in the Glines project warehouse since the early 1950's. This drum has the original labeling, and it is stored inside a large steel over-pack container. The only additional labeling on either container is that required by current state and federal regulations governing the storage and handling of the material. A careful inspection made of both containers on November 3, 1993, confirms there is no reference to "Agent Orange" anywhere on either drum as stated in the Report.

At the time representatives of the U.S. Fish and Wildlife Service made their Level I survey on February 2, 1993, there was stored at Elwha Dam, a 55-gallon steel drum containing about 10 gallons of an herbicide mixture of diesel oil and 2-4D, contaminated with 1.4 PPM of PCB's. This material was subsequently removed on March 4, 1993, by Burlington Environmental, Inc. of Seattle, Washington, and disposed of in accordance with applicable state and federal regulations. While we are highly skeptical that either the material container or over-pack drum ever included any markings or reference to "Agent Orange", we are unable to confirm this since the material is no longer on the Elwha Dam site.

In consideration of the above clarification, the unnecessarily inflammatory reference to "Agent Orange" should be removed from the Elwha Report.

Page 64 - Contaminants

We suggest this paragraph be modified to indicate that petroleum hydrocarbons (transformer oils) are currently used in electrical apparatus' at both projects.

Poluchlorinated biphenyl (PCB) contaminated transformer fluids were contained in certain electrical equipment in the past. Certified test records showed the PCB contamination levels to be relatively low. Further, all contaminated fluids have been removed from the affected equipment as shown by subsequent certified testing. Thus, even though a Level II survey may be appropriate to confirm whether toxic material are, in fact, present on the sites, it is necessary to recognize that comprehensive testing of all liquid-filled equipment in the recent past has been negative. There is no hard evidence to indicate significant hazardous materials on the site. We do have some test data which shows the absence of any such material. There is reason to be optimistic, rather than pessimistic, about the outcome of further surveys. See page 129, Summary and Conclusions, last sentence, third paragraph.

Page 113 1. Disposition of Project Lands

Second paragraph indicates "some uncertainty regarding the exact boundaries of project lands"--

- The exact boundaries of project lands are fully described in the original license for the Gline Canyon Project and, in the application for the Elwha Dam License. Neither document includes the 77-acre tract sometimes referred to as the McDonald Bridge Tract.

- Numerous private entities own lands along the Elwha River between the two projects and below the Elwha Dam.

- All of these lands "would be important to the long-term restoration efforts."

- P.L. 103-495 does not intend that all of these private lands would revert to Government ownership in support of restoration.

- The 77-acre tract, privately held by James River, is not a part of project lands. It is not contiguous, or appurtenant, to the Elwha Projects.

- The USGS Elwha River Level Gage happens to be located on this tract. However, the gage is not associated with the projects, or utilized in any way for project operation.

- In the early 1970's, James River was advised by USGS that they were abandoning the McDonald Gage. If James River wanted to continue its operation, we could do so by agreeing to pay all operating and maintenance costs.

- Even though the river level gage was not used for project operations, it has considerable value to the Clallam County Emergency Services Group, the Lower Elwha S'Klallam Tribe, and various state and federal agencies in monitoring flood events. For this reason, James River elected to continue this important service, and to upgrade the telephone interrogation feature. This service will continue to be of value after Government acquisition of project lands.

- Consideration for the Elwha hydroelectric projects of $29.5 million specified in section 3(b) of the Elwha Act was established as the net present value (cost) of the difference in energy cost from a fully-conditioned licensed project and the priority-firm market rate of the BPA energy purchased through Port Angeles City Light Utility, over a period of 40 years. The $29.5 million is consideration for foregoing licensed, producing, hydroelectric projects as described in the original Glines License and License/Relicense applications. It is not based on a specific quantity, or value, of lands owned by James River. This conclusion is confirmed by the informal committee staff analysis of the Elwha Act, which states that acquisition covers only facilities and lands "associated with operation" of the Projects. The lands and facilities on the 77-acre tract are in no way "associated".

It is therefore clear that acquisition of the McDonald Bridge Tract is not authorized by the Elwha Act. If the United States is interested in acquiring this tract through standard procedures, an offer to the end should be submitted to James River and Daishowa.

Overall, James River believes the federal agencies have done a good job in preparing the Report. We look forward to continuing our strong and positive working relationship with the agencies on this matter.

Very truly yours,

R.J. Morgan

Robert J. Morgan
James River Corporation

RJM/to

cc Maureen Finnerty
Donald C. Bauer
Orville Campbell

[illegible]

STATE OF WASHINGTON
DEPARTMENT OF TRADE & ECONOMIC DEVELOPMENT
General Administration Building • P.O. Box 42500 • Olympia, Washington 98504-2500

November 8, 1993

Dr. Brian Winter, Team Leader
Elwha Restoration Interagency Team
National Marine Fisheries Service
7600 Sand Point Way, N.E.
Seattle, Washington 98115

Dear Brian

Attached are the State of Washington's comments on the September 1993 public review draft of The Elwha Report. Individual state agencies have provided comments on specific elements of the report and they are prepared to provide any additional information you may require. I believe it may be useful for you to meet with representatives of the Department of Ecology to discuss their concerns over the issue of sedimentation. As was the case with the previous agency review draft, this document is well-prepared and generally consistent with the intent of Public Law 102-495. The State of Washington does have one serious concern that should be resolved before the report is finalized. According to Figure 7, page 131, the report appears to recommend that acquisitionn of the projects be delayed until at least September 1996, pending the completion of the Environmental Impact Statement on removal of the dams. This approach is inconsistent with the intent of the Elwha Restoration Act and should be changed. Because of the serious nature of this issue, Governor Lowry will also be writing to Interior Secretary regarding this matter, as well as the need to move forward with funding and project acquisition in federal Fiscal Year 1995. I will provide you a copy of that letter as soon as it is available.

Thank you for providing the opportunity to comment on this report. Please feel free to call me (206/586-3447), John DeYonge of Governor Lowry's Office (206/586-3447), or any of the agency contacts identified in the attached comments.

Sincerely,

David L. McCraney
Assistant to the Director

Attachment

State of Washington
Elwha Public Review Draft
Agency Comments

Washington State Energy Office

In determining likely replacement resources, the authors correctly recognize that the small amount of power provided by the dams--approximately 18.7 average Megawatts (aMW)--is unlikely to be replaced by a specific resource. Instead, the Bonneville Power Administration (BPA) will slightly advance, in time, its acquisition of 750 aMW of power resources (the current amount BPA expects to acquire during the next decade). Those resources will be made up of a mix of conservation, renewables, and natural gas-fired combustion turbines. Over the next ten years, variations in population, technology, and the economy will likely lead to changes in demand that offset current expectations by far more than 18.7 aMW, advancing or slowing the schedule for acquisition to a greater degree than that which would occur due to dam removal. Therefore, it is difficult to say more specifically what resources over time would end up replacing power from the dams.

In determining the costs of replacement power, the authors worked under the same uncertainty constraints. They correctly assume the cost of replacement power to be the difference in present value between regional costs for operating with and without the dams. Under the dam removal scenario, new resources were added in order of cost-effectiveness. Ideally, this is how the region would acquire new resources, and represents the best indication of what replacement power costs ought to be. The resulting numbers appear to be of a correct magnitude, comparable to the cost of some conservation, wind power, and combustion turbines (assuming some increase in natural gas prices). Contact: Jim Harding 206/956-2007

Department of Ecology

The various recommended alternatives and actions identified in the report appear, overall, to be compatible with the policy of the Shoreline Management Act, as well as floodplain management considerations to the extent such determinations can be made based on the current level of available information and provided that the following specific comments be considered.

- Plans for sediment management should incorporate a broader environmental perspective than the current document appears to take. It appears that the current alternatives do not consider the value and role of the sediment in the ecosystem. While the current distribution of sediment is a problem in terms of river stability and thereby the time necessary to re-establish a productive system, the sediment itself is part of the ecosystem. Consideration should be given to bio-engineering approaches to stabilizing the sediment. This may result in a more natural appearing, lower cost and more self-sustaining river ecosystem.

- More specific discussion should be given to off-site sediment disposal, including alternative sites for disposal, their costs, and pros and cons. It is not sufficient to simply state that this issue will be addressed at a later time. Disposal of the volume of sediments entailed by dam removal will be a major issue, and any potential roadblocks should be identified early on, certainly before any final decision is made regarding dam removal. In our comments on the agency review version of the report, we asked that some discussion take place on the desirability of removing the sediments to the Ediz Hook, where it would have been deposited under natural conditions. Contacts: Rod Mack 206/407-6270 and Tom Elwell 206/407-7982

- We note that the current Corps of Engineers levees on the lower Elwha are built to provide three feet of freeboard above a 200-year event and that the result of the dam removal would be to raise the levees four feet. This appears to exceed the requirements for maintaining the status quo. There is no explanation of the need for this action or of the cost differential associated with it. Further, there is no consideration of other means of addressing the flooding issue on the lower Elwha such as setback levees or other methods that may serve to provide a reasonable level of flood protection in the area at a potentially lower cost while also allowing the river to re-establish a more natural character.

Department of Wildlife

Department of Wildlife concurs with the contents of this report and appreciates attention given to our comments on the July 2, 1993, draft report. It appears that all of our comments were addressed or incorporated into this draft.

We feel very strongly that complete restoration of the ecosystem and related fish and wildlife resources cannot be accomplished without removal of both Elwha and Glines dams. Also important are the restoration methods. We feel this report has done a good job of identifying the pros and cons of each scenario which will lead to a well-informed decision. While we would like to see the ecosystem restored to a natural state, we recognize the constraints and concur that methods described in Scenarios 5, 6 and 7 appear to provide the most desirable results, and should be investigated further.

The discussion on Disposition of Project Lands in Appendix I describes several land use options--natural resource, economic development, mixed use, residential and conservation (Refuge). We would hope that the majority of these project lands will remain in a natural state to preserve the biological integrity of the entire river corridor and to compensate for wildlife resources lost for the 60 to 90 years since the dams were constructed. We recommend that any economic, residential or mixed use be minimized and confined to already disturbed areas.

We would also recommend that economic incentives not include logging

The criteria used to determine which lands are preserved in a natural state should not be restricted to steep slopes but also include the low gradient areas Contact Dave Gufler 206/249-6522

Department of Health

Potential impacts to public water supplies are addressed in section VI E 3, "Water Use", VI E 5, "Impacts of Dam Removal on Water Quality", and VI E 6, "Mitigation of Water Quality Impacts" These sections address comments made in previous letters from this office The following are comments regarding the information presented in the subject report

- This report contains the first discussion which has come to my attention regarding increases in organic matter concentrations in the river water as a result of the project There is the potential that an increase in organic material in the river water could cause an increase in Disinfectant Byproducts, as reflected by measurements of Trihalomethanes (THM's), in the water supplies practicing disinfection It is not possible to evaluate the significance of this potential impact without specific information on the nature of the organic materials and how they will travel through the ground water If a violation of drinking water standards occurs, corrective action will be required

- The degree of detail presented in the report regarding impacts to public water supplies and mitigations to those impacts is minimal The report states, "Additional work would be required during the EIS/advanced planning stage to confirm the viability of each of the alternatives, to identify any additional alternatives, and to work with the affected entities to develop a broad consensus as to which alternative is preferred for each diversion" While the initial proposals to mitigate impacts to public water supplies may be appropriate, I agree that more study is required Contact Karl Johnson 206/753-2452

Department of Fisheries

Our previous comments and concerns regarding the earlier agency review draft report (July 1993) have been, for the most part, included or rectified in the public review draft

Some of our major concerns cannot be sufficiently addressed in the report but, rather during the EIS process which is scheduled to start in early 1994 We feel confident that any potential impacts on the lower Elwha River fish stocks and their habitat and the integrity of the WDF fish-rearing facility will be resolved at that time Contact Bob Gerke 206/902-2526

Department of Trade and Economic Development

The state's fiscal system, structure, and resources make cost sharing on this project impractical Precedent clearly shows that Elwha restoration should be a federal responsibility The report correctly concludes that it is not appropriate to require state cost sharing for dam removal or other aspects of the Elwha River ecosystem restoration Contact David McCraney 206/586-3447

PUBLIC WORKS

CITY OF PORT ANGELES

321 E. FIFTH • PO BOX 1150
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PORT ANGELES, WASHINGTON 98362
FAX (206) 452-0353

November 5, 1993

Dr. Brian Winter
Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362

RE: The Elwha Report - Public Review Draft September 1993

Dear Mr. Winter:

The City of Port Angeles has reviewed the Public Review Draft of the Elwha Report and we have the following comments:

We first want to thank the preparers of this report for incorporating the comments that we submitted on the agency review draft. The report recognizes the following points related to water quality which are very important to the City and the other water users on the river.

> Water quality downstream of the dams will deteriorate with any of the dam removal options. The predicted sediment levels for all options are significantly higher than we now experience at our diversions. There will be both short-term and long-term increases in turbidity and suspended solids concentrations that will affect the operability of our existing municipal water system, increase capital and operating costs, and impact our compliance with state and federal drinking water regulations.
>
> As specified in P.L. 102-495, The City, Dry Creek, and the industrial water users on the Elwha River must be protected from the water quality impacts of dam removal. The evaluations and costs associated with this mitigation are included as an integral part of the dam removal process.
>
> Additional work is needed during the EIS/advanced planning stage to evaluate the options available to mitigate the impacts to our municipal supply and to estimate capital and long term operating costs.
>
> There is the need to work with the affected entities to develop a consensus approach for mitigation for each diversion.

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The position of the City of port Angeles has always been that the dams not be removed without the absolute certainty and commitment that water quality impacts will be mitigated. We are

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encouraged that this report acknowledges our needs while recognizing that significant additional work is needed during the EIS/advanced planning stage to develop mitigation strategies.

We have commented previously that our own consultant studies indicate the mitigation costs on pages 94 and 95 may be low and that there are other alternatives to those identified. The text now states that the mitigation options will be better refined during the EIS/advanced planning process. We appreciate this addition to the text and the emphasis on developing a consensus mitigation plan.

Page 35 of the report states that additional turbidity data on the upper river will be collected during the EIS process. The report also includes a cost estimate for data collection (page 134); however, it does not define what these additional studies would be. We believe these studies must include future river flow and hydrology, river mechanics, and seasonal water quality sampling above and below the dams. We ask to be involved in scoping these studies to help assure sufficient data is collected to identify, evaluate and estimate the costs for mitigation options.

On page 92 the footnote states:

> "A Ranney will is considered to be a surface water diversion."

We request that this be changed to read:

> "Although the City's Ranney well operates on a surface water right issued by the State of Washington, it provides filtration and exhibits may characteristics of a groundwater supply."

Thank you for incorporating our previous comments and for your consideration of the additional items in this letter. We hope to participate in the EIS/advanced planning process to help develop the water quality mitigation plans for our water supplies.

Sincerely,

Jeffrey A. Pomeranz

Jeffrey A. Pomeranz
City Manager

cc: CH2MHill

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
P.O. Box 40002 • Olympia, Washington 98504-0002 • (206) 753-6780

November 8, 1993

The Honorable Bruce Babbitt
Secretary
U.S. Department of the Interior
18th & C Streets, NW
Washington, D.C. 20240

Dear Secretary Babbitt:

I am writing to express my strong support for the timely implementation of the Elwha River Ecosystem and Fisheries Restoration Act, and provide Washington's comments on the Elwha Report Public Review Draft. The draft report correctly concludes that removal of both the Elwha and Glines Canyon dams is feasible, and is the most appropriate means of restoring the Elwha River ecosystem and its native anadromous fisheries. The interagency group that produced the draft report is to be commended for preparing an excellent document that will help us resolve the many issues surrounding the future of the Elwha River. I endorse the comments of individual state agencies which are attached to this letter.

Because of the importance of this issue to the natural resources, economy, and people of the Olympic Peninsula and state of Washington, I would like to highlight several items that are of particular importance. First, implementation of this historic settlement agreement must go forward in a timely manner according to the sequence anticipated by all involved parties. Unfortunately, according to Figure 7, page 131, the report appears to recommend that acquisition of the projects be delayed until at least September 1996, pending the completion of the Environmental Impact Statement on removal of the dams. This approach is not consistent with the history, spirit, and intent of the restoration act and it is my hope that this situation can be remedied before the final report is presented to the Congress.

Second, the timely implementation of the restoration act will require adequate federal funding for project acquisition, environmental analysis, dam removal, water quality protection, and fish and wildlife restoration. The federal funding that will be needed for Fiscal Year 1995 is approximately $11 million for project acquisition and the preparation of the required environmental impact statement. I hope you will request and support the inclusion of these funds in the Interior Department's 1995 budget.

Finally, we are all encouraged by the attention and support you are providing for Elwha restoration. As Governor, I am committed to working with you and your department, other federal agencies, our delegation and other key elements of Congress, the Elwha Tribe, project owners, conservation community, and local governments in Port Angeles and Clallam County to make sure this historic, cooperative effort succeeds.

Thank you for considering Washington's perspectives on this most important matter.

Sincerely,

Mike Lowry
MIKE LOWRY
Governor

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-2255

NOV 09 1993

Planning Branch

Dr. Brian D. Winter, Team Leader
Elwha Restoration Interagency Team
National Marine Fisheries Service
7600 Sand Point Way N.E.
Seattle, Washington 98115

Dear Dr. Winter:

This is in reply to the October 7, 1993 letter from Maureen Finnerty, Superintendent, Olympic National Park, requesting Seattle District review of the draft report entitled "Restoration of the Elwha River Ecosystem and Native Anadromous Fisheries". We have reviewed the report and our comments are as follows.

General:

Some sort of feedback to each reviewer to advise if comments have been accepted/rejected would be helpful. This would allow the reviewer to know which comments have been accepted/rejected without backtracking and making the same comment(s).

The report does not recommend a specific plan for removal and therefore is difficult to review as a report that would serve as a basis for continued movement toward dam removal. No Benefit-to-Cost (B/C) analysis was performed and therefore it is difficult to state that the removal and restoration program is indeed "feasible" in the economic sense. Economic considerations would provide not only the basis for the recommended construction/demolition plan but also the justification for removing the dams and re-establishing the fish runs. The Corps has done some work in analyzing modifications of existing projects for fish and wildlife habitat purposes and the resulting benefits. It is possible for a similar analysis be performed for this project such that a B/C could be developed.

There is no "Definitive Plan" for dam removal presented in the cited Chapter VI, Definite Plan For Dam Removal, page 63. The information is preliminary and conceptual in nature. The chapter presents four options for dam removal and nine scenarios for sediment management/removal with estimated costs for dam removal and sediment management ranging from $66.7 to $216.1 million. Page 86 of the report states, "With out specific design criteria and objectives, final recommendations for a specific Sediment Management solution cannot be made." Apparently, additional studies and criteria by others are required before a definite plan can be finalized. The report clearly presents a discussion on the dam removal options and sediment management scenarios considered. It should also present a recommended plan and associated costs. This recommended plan should be supported by engineering, environmental, and economic data.

As mentioned in previous correspondence, the report should note that sediment analysis would be required prior to disposal of any material into the Puget Sound Dredged Disposal Analysis Site located in marine waters near Port Angeles. Sampling of sediments would likely be required if the material is placed at other locations in marine waters.

Specific Comments.

1. The discussions regarding impacts of dam(s) removal on the Corp's lower Elwha levee project are confusing. Pages 96 and 129 of the main report state that the cost of levee modifications required to ensure that the authorized level of protection is maintained after dam removal is estimated to be $2.1 million. However, Appendix F does not elaborate on this item, with the exception of listing levee modifications as a disadvantage of the Erosion method of sediment management. These costs of levee modification are not apparent in the itemized cost estimate shown on pages 110 and 111. The discussions on the other two methods of sediment management, Removal and Retention, do not discuss their affects on general sediment processes downstream from the dams or on the levee specifically. Removal of the dams will eliminate the sediment retention capability afforded by the dams at this time, and will have an affect on the levee and sediment processes downstream regardless of the method of sediment management selected and must be included in the evaluations. The Corps will require detailed documentation of analyses used to determine effects on the levee for review and approval of the plan.

2. In Appendix E, page 18, a comparison of discharge frequencies from the Corp's curves for the MacDonald bridge gage indicates that the 5 yr event has increased about 8 percent between 1967 and 1991. This increase could affect the diversion and flood passage plans proposed for Glines Canyon and Elwha dams during demolition.

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3. In the Restoration Report on page 88, the maximum recorded discharge in recent years is 28,700 cfs on 21 November 1990 rather than the 27,700 cfs in 1980 as stated in the report.

4. Chapter VI, Definite Report for Dam Removal, para C.2 dam safety, page 65. This paragraph should also address the dam safety aspects of dam removal, not merely the dam safety of the existing structures. The dam safety aspects of the existing dams as well as the removal aspects should be coordinated with the State of Washington, Department of Ecology, Office of Dam Safety. The Washington Office of Dam Safety shares jurisdiction with FERC.

5. Page 47, B. Responsibilities and Liabilities. This section should include a description of the necessary permits and approvals needed to accomplish the various alternatives. Specifically, a Department of the Army permit would be required under Section 404 of the Clean Water Act for any work that involves the discharge of any dredged or fill material into the Elwha River, into marine waters or into any wetland areas. Also, a permit would be required under Section 10 of the Rivers and Harbors Act of 1899 for any work that is performed in any navigable waters (such as any marine waters waterward of the line of mean high water). Many of the alternatives, including the retention of both dams with new fish passage structures, would involve work subject to the Corps of Engineers regulatory authority.

6. Volume II, Appendix F, Page 108-115. The cost summaries for Scenarios 2 & 4 appear to show considerable error (at least one order of magnitude) in the unit cost for the dredge disposal pipeline. Unit costs for typical slurry or dredge pipelines of this size, capacity, and use generally are in the range of $75-80 per linear foot not the $765 shown. This error would multiply through the mobilization, contingency, overhead, profit, tax, and engineering and construction management line items, resulting in significant over-estimation of the total costs. The end result is that Scenarios 2 & 4 merit further refinement and inclusion in the study process.

7. Sediment management/removal alternatives, general comment. Seattle District has performed a cursory analysis of alternative methods of sediment management/disposal for the two reservoirs. These additional alternatives would utilize one or more large suction dredges similar to Corps navigation dredges which would discharge into 1) retention areas within the reservoirs, 2) a continuous slurry pipeline with booster pumps to the Strait of Juan De Fuca or to another downstream site, or 3) screening and sorting facilities and a continuous conveyor system to carry the material to a downstream site or the Strait. Large scale continuous conveyor systems have been used to remove similar volumes of sediment from flood control reservoirs at significant cost savings. These alternatives could include the sorting and holding of large volumes of appropriately sized gravels for use in restoration of downstream spawning areas. This would help accelerate recovery of the most adversely affected reaches of the river. We believe that significant cost savings might be achieved with the above alternatives and that additional study is justified.

Thank you for providing us with an opportunity to review the draft document. We stand by ready to offer our assistance and experience in preparation of any economic analysis, the proposed EIS and future design documents. Please call Mr. Lester Soule at 206 764-3699 if you have any questions.

Steven Foster
Acting Chief, Planning Branch

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GOD AND PHYSICS UNLIMITED
Eleanor Fraser Little
315 West 7th Street
Port Angeles, WA 98362
(206) 457-1020, Oct. 5, 1993

Secretary of the Interior: Bruce Babbitt
Washington, D.C.

Why We Should Not Remove The Elwha Dams

Port Angeles Water Supply

Removal of those dams could endanger the water supply of Port Angeles, since it depends on the River water to filter down into the aquifers and the deep wells of the area. Low rain conditions and late fall river flows would be far lower if the dams were not there, gradually releasing the water. That constant flow maintains the underground aquifers during dry spells and in times of heavy usage. Without those dams, many people in the Port Angeles, may be without a safe water supply during the fall and winter.

Toxic Debris Will Clog Streams And the Estuaries.

Dams are known to build up considerable debris that may have toxic materials in them and the silt will harm fish habitats all along the river.

Natural Dams and Indian Dams

Natural procession of events indicates in times past, many dams would be created by accident, due to slides, fallen trees and debris, therefore dams on rivers is the normal and not unusual. Surely the Indians (long before the white man came) would dam sections of the river so they could catch fish easier. Thus a dam is historically a natural item on a river, in spite of the newer ones being built by man of stones and concrete. Dams also guarantee a water supply in times of drought.

Lakes Form Valuable, Beautiful and Unique Wildlife Habitats!

Lakes are a rarity in this area. Removal of a lake and water supply, its host fish, animals and wildlife will be a harsh blow to the animals and certainly to the fish in those lakes! Not to mention to the anglers who fish for same! Lakes are pleasant to see and they offer a contrast to the rivers below and above the dams. Animals and man must have water to survive. Lakes trap fresh water required for life by animals and man.

Trumpeter Swans And Other Migrating Birds

Trumpeter swans land in on Elwha River lakes during migration. Removal of those dams means they will have to land nearer to areas where hunting goes on, thereby removing those dams endangers an endangered species and removes a safe resting site along the way for many birds during migration. Eagles fish in those lakes as do other birds including the marbled murrlet and spotted owl. Removal of lakes violates water and wildlife laws.

Heavy Equipment - Destroys Habitats

The trucks, machinery and people needed to remove those dams will be enormous. Disturbance of the wildlife and entire area will be extreme and that disturbance will go on for years.

Salmon Netted at Sea and Across the Streams

Our salmon are being netted at sea by the Russians and others. We get only a small return of any kind of salmon because so many nations "pirate our fish". We are unable to protect salmon from over-fishing if they go to sea, but we can protect the fish that live in lakes! Therefore we are destroying a present safe and sane fishing sites for uncertain and unlikely to yield much return sea sites and sea-going fish.

Nuclear Power Monopoly

Removal of hydropower plants means nuclear power plants will get more customers and that means more eon long dangerous pollution and more opportunity for them to open closed nukes or to build enrichment nukes that dump secretly and sell the extra weapon material on the black market --and risk the area by doing enrichment on the sly. Thus the nulcear/mafia and terrorists (criminals) will profit by the removal of the dams! But all others (including the Indians and "their" salmon) will not!

Canada Benefits as This Area's Economy Is Harmed By Selling Us Its Hydropower at a Huge Profit!

So removal of the dams means the remaining existing (or to be opened) nuclear power plants make more money, and/or Canada gets a huge lucrative coutract and new other fuel power plants of one kind or another will be needed, and all that to restore fishing streams for fish that never make it up the river in the first place since they are over-fished at sea and netted at the mouth of the streams.

It Will Destroy The Area Economy and Create a Power Monopoly

Higher electic costs mean industry will have to charge more for their products, all people pay more for electricity and the power companies can charge what they want since there is no competition. A power monopoly will be created and one that favors nuclear power too. And if other power plants are built, it will be at higher costs and with the area and nation held back by its lack of enough electricity! And later on by more expensive electricity.

Other More Sensible Alternatives Are Available!

Fish that can be carried by man down a river (to bypass power plants) can be carried up it to spawn. Therefore removal of those dams is totally unnecessary since the nets (or traps) can catch and take upstream those fish. So neither dam needs to be removed to restore wild salmon and doing that will increase the likelihood of survival of the salmon, not lessen it. I might add they could stop the Indians from netting across streams and could trap fish before they hit a seal rich area.

Indians Have Corner on Uranium Market and so Are Nuclear.

The Indians own 50% and more of the uranium supplies in America. Therefore they stand to profit by destroying hydropower (for fish), even when the salmon industry cannot be protected (at sea or from sealions or from the Indians and their nets) or sensibly restored. Thus removing those dams help sell or force us to use the nukes and therefore Indian uranium.

Indians and the Mafia

Indians have strong mafia ties, gambling and nuclear mafia ties, so they have many non-fishing reasons to use the fish as an excuse to destroy our area's water supply, two lakes, and the power supply -- they have nuclear reasons for wanting those dams down. Some (but not all) may have mafia, nuclear and therefore black market in illegal weapon and nuclear material reasons for wanting those dams down. Indians seem not-united, but somehow, their disputes give them more benefits each and every time and always from all the rest of us.

Indians Will lose Out in the Long Run

Indians want us to gamble in their new casinos. But who will have the money to do that when power costs are up and the mills and industries close? Also when people realize how much the Indians and their salmon scheme cost them, there will be a lot of hatred for them because of an entire area being destroyed by their selfish and short-sighted fishy/nuclear schemes.

Expense

We cannot pay our bills now --not locally, State-wide or Nationally, therefore we cannot afford to take the dams down anyway. Besides, its incredibly dumb and short-sighted And a nuclear power monopoly scam at that.

Sincerely

Eleanor Fraser Little

470-PNWR
100403AA

WBR

October 5, 1993

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Mr. Babbitt

Please continue your efforts in support of the restoration of the Elwha River.

Yours truly,
John P. Smith
102 Discovery Bay St.
Sequim, WA 98382

TIA

Dear Secretary Babbitt. 10 22 '93

Ten years ago as a college intern, I ventured to Seattle to work with Friends of the Earth. I worked on several projects, one being "Free the Elwha". People have come and gone in the struggle to see this ecosystem restored, now there is an opportunity for that to be realized. I am immensely excited that a vision I helped create is about to be actualized. I join all of those who urge you to do everything you can to see that Congress appropriates the funds needed to set the Elwha free. Thank you for your help in realizing this vision, I commend you and your efforts.

Sincerely

lisa barbeau
2708 E. 14th ave #2
Denver, CO 80206

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WBR

October 5, 1993

Date Initial

The Honorable Bruce Babbitt
c/o Olympic National Park
600 E Park Ave
Port Angeles, WA 98362

Dear Mr Babbitt

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Sincerely

lisa barbeau
2708 E. 14th ave #2
Denver, CO 80206

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END

05/11/96